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To establish suitable admission requirements for freshman and transfer students in the College of Business at Brigham Young University, it was necessary to determine what factors are predictive of future success in the College. Three major areas were investigated: lower division college preparation as recorded in university transcripts; high school preparation as recorded in high school transcripts; and American College Test (ACT) results. These data were collected from the records of students who graduated or were academically suspended during 1965 and 1966. Frequency distributions, statistical tests of difference, and correlation analysis tests were processed on the computer for 783 samples. Significantly different variables which showed a high correlation with university grade point average (GPA), lower division core GPA, and grades in specific lower division core courses were considered for selection as admission requirements to the College of Business. A review was made of the relevant literature on academic success factors in general and on success factors in the College of Business. Admission practices of other colleges of business in major universities in the West were reviewed. Findings were divided into the following sections: academic status; transfer status, major department and sex; and relationship of variables. Within each section, the subfactors of lower division preparation, high school preparation, and ACT scores were examined and conclusions were drawn concerning their respective importance as predictors of success. Based on the findings recommendations concerning admission requirements were made and suggestions put forth for further research in the field. (JS)

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AN ANALYSIS OF INTELLECTUAL FACTORS BEARING ON SUCCESS IN THE COLLEGE OF BUSINESS, BRIGHAM YOUNG UNIVERSITY, PROVO, UTAH

A Dissertation
Presented to the
Graduate Department of Education
Brigham Young University

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

---

by
Harold T. Smith
July 1967

This dissertation, by Harold T. Smith, is accepted in its present form by the Graduate Department of Education of Brigham Young University as satisfying the dissertation requirement for the degree of Doctor of Education.

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CHAPTER I

THE PROBLEM

I. NATURE OF THE PROBLEM

Introduction

All universities impose some type of selective requirements on students applying for admission. The restrictiveness of these requirements varies from institution to institution.

When a student is admitted to a university there is an implied understanding that he has a good chance to succeed. In other words, if the student will apply himself to work assigned, he can expect to graduate. Of course, there will be admission mistakes. Some students who appear to be outstanding prospects will fail. Others who might be successful in college will be eliminated.

At Brigham Young University, the determination for admission requirements is the prerogative of the Board of Trustees acting on the advice of the administration. The College of Business at Brigham Young University has not designated admission requirements. If a student is admitted to the University, it is also assumed that he is capable of doing satisfactory academic work in the College of Business.

It is reasonable to assume that every student will not do equally well in all academic disciplines. Various background experiences may provide an advantage in a given academic area. The identification of these background experiences and other characteristics which indicate potential success in the College of Business is a major purpose of this study.

The designation of admission requirements should help the prospective business student become informed on what is expected of him and should help prepare him to enter college. The student who meets admission requirements and applies himself should be reasonably assured that he will be able to graduate from the College of Business.

The knowledge about the College of Business student gained from this study will be helpful in planning the business curriculum. This knowledge will also be useful in helping the student to plan his academic program.

Statement of the Problem

This study was designed to identify those intellectual factors that have a bearing on success in the College of Business at Brigham Young University and to draw from these factors recommendations for admission requirements.

Questions. Answers to the following questions provided a description of the business student. The questions were divided into three basic areas: (1) Lower-Division Collegiate Preparation, (2) High School Preparation, and (3) American College Test Results.

To determine the specific nature of the Lower-Division Preparation, the following questions were asked:

1. What percentage of College of Business students go on to graduate and what percentage are academically suspended?

2. In which year (Freshman, Sophomore, Junior, or Senior) are students classified when they are suspended for academic reasons?

3. What is the total mean university G.P.A. received by all Brigham Young University seniors? What G.P.A. (total university and College of Business lower-division core) do College of Business graduates and academically suspended students receive?

4. What is the distribution of grades for College of Business students in each of the lower-division College of Business core courses (Economics 111 and 112, Accounting 201 and 202, Mathematics 101 and 105, and Statistics 221)? What percentage of the students in the College of Business do not take these courses?

5. During which year are each of the lower-division College of Business core requirements taken by College of Business students?

6. How many times are lower-division core courses repeated by College of Business graduates and by academically suspended business students?

7. How many semester hours of collegiate credit are transferred from other insitutions of higher education by College of Business graduates as contrasted with business students academically suspended by the University?

Answers to several questions pertaining to High School Preparation were also sought:

1. What is the mean number of semester units of high school mathematics, English, science, social science, and business completed by College of Business majors?

2. What high school grades (grades in specific subjects such as algebra or American History; grade average in subject matter areas of mathematics, English, science, social science, and business; and total high school grade point average) do College of Business majors achieve?

3. What stanine rank do College of Business majors achieve in high school?

4. What did students in the College of Business major in while in high school?

The following question was asked about American College Test results: What mean American College Test (ACT) scores (composite, mathematics, English, social science, and natural science) do College of Business majors achieve?

The preceding questions relating to Lower-Division Collegiate Preparation, High School Preparation and ACT Results were analyzed in terms of the students' Academic Status (i.e., Graduated or Academically Suspended). Most of these questions also pertained to Transfer Status, Major Department, and Sex classifications of the data presented in Chapter 4. In addition, the following specific questions were asked concerning Transfer Status:

1. What percentage of the students who graduate or are academically suspended transferred from other colleges and universities? What percentage completed all of their academic work at Brigham Young University?

2. What effect does being a transfer student in business have on a student's grade point average (total university and College of Business lower-division core)?

Finally, the following specific questions pertaining to Sex and Major Department were asked:

1. What percentage of students who graduate or are academically suspended are males and what percentage are females?

2. What percentage of those students who graduate and those who are academically suspended major in each of the academic departments in the College of Business?

Hypotheses. Hypotheses developed in this section were based on the questions asked in the previous section and were stated in a null form.

1. Students graduating from the College of Business do not achieve a cumulative grade point average (total University, or lower-division college core) which is significantly different from the G.P.A. which is achieved by all Seniors at the Brigham Young University.

2. College of Business graduates do not differ significantly from business students who have been academically suspended with regard to the following factors of lower-division collegiate preparation:

   a. mean grades received in the following lower-division college courses: Economics 111 and 112, Accounting 201 and 202, Mathematics 101 and 105, and Statistics 221.

   b. mean year in which each of the lower-division College of Business core requirements are taken

   c. mean number of repeats of lower-division core courses

   d. mean number of semester hours of transfer credit

3. In considering the following aspects of high school preparation College of Business graduates do not differ significantly from business students who have been academically suspended:

   a. mean number of high school semester units of mathematics, English, science, social science, and business completed

   b. high school grade point average (mathematics, English, science, social science, business, and total)

   c. mean grades in such specific high school subjects as algebra, geometry, and economics

   d. mean stanine rank

   e. high school major

4. College of Business graduates do not differ significantly from business students who have been academically suspended with regard to mean ACT scores (composite, mathematics, English, social science, or natural science).

5. In comparing College of Business graduates with business students who have been academically suspended, there is no significant difference in the following general factors:

   a. transfer status

   b. major department

   c. sex

6. There are no significant differences between transfer and non-transfer College of Business graduates and students academically suspended with regard to G.P.A. (total university, or lower-division core G.P.A.).

7. For transfer students only, between graduates and academically suspended students there is no significant difference in the grades received at other colleges or universities for lower-division college core courses.

8. There are no significant differences between transfer and non-transfer students in the following factors:

    a. lower-division college core G.P.A.
    b. high school preparation
    c. mean composite ACT scores

9. There are no significant differences among the College of Business academic major departments in G.P.A. (total university, or lower-division core G.P.A.)

10. There are no significant differences among students majoring in each of the College of Business academic departments in number of high school units of mathematics taken, grades in high school mathematics courses, and grade average in high school mathematics.

Admission Requirements. After pertinent questions were answered and hypotheses were accepted or rejected on the basis of significance of difference between two variables, the next logical step was to determine relationship between variables. The dependent variable in this study was success in the College of Business which has been defined as graduation from the College of Business. The grade point average reflects the degree of success in academic studies.

The major purpose of the study was to determine the best predictors of success in the College of Business. These data will determine admission requirements for the College of Business.

Total university G.P.A., lower-division core G.P.A. and grades in lower-division core courses were correlated with selected variables from the following:

1. lower-division core G.P.A.
2. grades in lower-division core courses
3. high school semester units of mathematics, English, science, social science and business
4. high school grades in specific subjects such as algebra, geometry, and economics
5. high school grade point averages (total, mathematics, English, science, social science, and business)
6. high school stanine rank
7. ACT scores
8. year in which lower-division core course taken
9. transfer status, grades, and amount of credit transferred

Delimitation of the Study

This study was restricted to students enrolled in the College of Business at Brigham Young University during 1965 and 1966. The study was further restricted to those students who were graduated or academically suspended during this period. Only College of Business lower-division core courses and high school mathematics, English, science, social science, and business courses were studied.

II. BACKGROUND

There has been limited research pertaining to the characteristics of the Brigham Young University student. Little information has been systematically identified and organized about the College of Business student at the Brigham Young University.

In an effort to improve advisement and learn more about the students enrolled in the College of Business at Brigham Young University, the faculty of the College of Business approved the establishment of the Business Fundamentals Division as an administrative unit in the College of Business. During its first school year of operation, 1966/67, all new freshmen and transfer students who had not completed the College of Business lower-division core requirements were assigned to this division. During the second year of operation, the school year 1967/68, both sophomore and freshmen as well as transfer students will be included.

Before transferring from the Business Fundamentals Division to one of the academic departments in the College of Business, students are required to complete the lower-division core courses with a 2.25 G.P.A. They must also have completed 62 semester hours of approved university credit. These required courses should provide the necessary background and insure success in upper-division business courses. Providing sound advisement and insuring the early completion of lower-division courses are the major purposes of the Business Fundamentals Division.

Another purpose of the Division is to orient the student to the College of Business, the business world, and vocational opportunities. During this two-year period of assignment to the Business Fundamentals Division, the student will determine in which area he desires to major.

III. DEFINITION OF TERMS

Business Fundamentals Division

This is a division of the College of Business at Brigham Young University which directs the advisement of lower-division students. The major purpose of this organization is to upgrade the business program by insuring early completion of the lower-division college core courses. It is also responsible for college and vocational orientation programs. Research pertaining to business students is also a responsibility of this organization.

College Core Courses

These are courses in business and related subjects which are required of all students majoring in the College of Business. Lower-division core courses are those normally taken by freshmen and sophomore students. All students in the College of Business with the exception of Business Teacher majors are required to take the following lower-division core courses:

1. Accounting 201 and 202 (Elementary Accounting)
2. Economics 111 and 112 (Principles of Economics)
3. Mathematics 108 (Mathematics for Business Administration)[1]
4. Statistics 221 (Principles of Statistics)

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[1] Mathematics 108 is a replacement for Mathematics 105 which was formerly required. Data for this study are collected for Mathematics 105 or its equivalent.

Because of the heavy load of professional education courses, Business Education teaching majors were required to take only Accounting 201, 202 and Economics 111 or 101 to meet the College lower-division core requirements.

While Mathematics 101 is not actually a part of the lower-division core requirements, it will be included here for convenience of discussion. It will not be included in the computation of the lower-division core G.P.A.

Academic Departments

The four academic departments of the College of Business at Brigham Young University are as follows: Accounting, Business Education, Business Management, and Economics.

Most Economics students major in the College of Social Science rather than in the College of Business.

Though the Statistics Department is organizationally assigned to the College of Physical and Engineering Science, a statistics student may major in the College of Business.

Academic Suspension

The Brigham Young University Bulletin: Catalog of Courses 1966-68 defines the conditions for academic suspension:

> Suspension. A student will be suspended from the University if at the end of any probationary semester his cumulative record at B.Y.U. shows a shortage of 12 grade points from that required (1.75 for the first 31 semester hours and 2.00 for all remaining hours), and his current semester grade average is also deficient.

A student, whether on probation or not, will be subject to suspension if the Academic Standards Committee at any time determines that he is deficient in his academic achievements.[2]

Grade Point Average

The grade point average (G.P.A.) was computed on the basis of: A = 4.0 grade points, A- = 3.7, B+ = 3.4, B = 2.7, C+ = 2.4, C = 2.0, C- = 1.7, D+ = 1.4, D = 1.0, D- = .7, and E = 0.

$$\text{G.P.A.} = \frac{\Sigma\ (\text{G.P. x Sem. Hrs.})}{\text{Sem. Hrs.}}$$

Where: Σ = Total for the semester
G.P. = Grade points earned on basis as shown above
Sem. Hrs. = Semester credit earned

High School Business Major

For purposes of this study a high school business major was defined as any high school student who has taken any high school business course in addition to two semesters of typewriting.

Transfer Student

In this study a transfer student was defined as any Brigham Young University student who has completed ten or more consecutive semester hours of academic work at another college or university.

Native Student

A native student was defined as a Brigham Young University student who had not had ten or more consecutive semester hours of academic work at another institution of higher education.

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[2] *Brigham Young University Bulletin*: *Catalog of Courses--1966-68*. (Provo, Utah: B.Y.U. Press, 1966), 35-36.

IV. ORGANIZATION OF THE REMAINDER OF THE STUDY

Organization

Chapter II of this study reviews doctoral, master's, and other research studies which relate directly to the topic of admission requirements. First, studies which deal with general success in the University lower-division and upper-division are reviewed. Then studies which pertain to success in colleges of business are examined. Next catalogs of large Colleges of Business in the western states are reviewed to determine what, if any, admission requirements are stipulated. Finally, specific research studies pertaining to Brigham Young University and its College of Business students are reviewed.

Chapter III presents in detail the method of investigation. There is included here the following sections: (1) General Procedures, (2) Population, (3) Selection of the Sample, (4) Data Reviewed in this Study, and (5) Statistical Analysis.

The findings of the study are presented in Chapter IV.

Chapter V contains the summary, conclusions, and recommendations resulting from the study.

Summary of the Chapter

This first chapter has introduced the need for selective admission requirements for the College of Business by posing questions related to the characteristics of students in the College of Business. These questions were divided into three major areas: (1) Lower-Division Collegiate Preparation, (2) High School Preparation, and (3) American College Test Results. Hypotheses were then developed to determine significant differences between related variables. Relationships between selected collegiate grade point averages and other variables to be determined in the study were then designated. Those variables which predict success were designated as admission requirements for the College of Business. The study was delimited to those students who were graduated or academically suspended from the Brigham Young University while majoring in the College of Business during the period 1965 and 1966.

The Business Fundamentals Division, an advisement organization of the College of Business, was described. It is the division that is responsible for insuring that all new students in the College receive proper academic advisement. Another major function is to insure that those business students who are admitted to a major department complete lower-division core requirements with a 2.25 G.P.A. before being admitted to that department.

CHAPTER II

REVIEW OF THE LITERATURE

I. INTRODUCTION

Selection of university applicants and admission to the university has become the most intensively explored topic in educational-psychological and administrative research. During the period of 1930 to 1960 there were about 800 different research studies completed in this area.[1]

The phenomenal increase of population in the United States, bringing with it vastly increased university enrollments, demands more effective methods of selection in college admission.[2] In order to avoid academic failure it is necessary to identify certain measures that might be sufficiently related to academic performance to be used for prediction purposes. More effective selection measures should reduce the number of students unable to achieve academic success.[3]

Most universities require some kind of scholastic attainment in high school subjects before a student can be admitted. The usual criteria for admission include: (1) high school academic records, (2) the results of scholastic aptitude and/or achievement tests, (3) the recommendation of the high school principal, and (4) satisfactory personality ratings.[4]

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[1] Joshua A. Fishman and Ann K. Pasanella, "College Admission-Selection Studies," Review of Educational Research, XXX (October, 1960), 298.

[2] George A. Kramer, "High School Class Rank and Academic Performance in College," (unpublished Doctor's field study, Rutgers University, 1958), Dissertation Abstracts, XX (March, 1960), 3575.

[3] Donivan J. Watley and H. T. Martin, "Prediction of Academic Success in a College of Business Administration," Personnel and Guidance Journal, LXI (October, 1962), 147.

History of University Admission Procedures

Admission to medieval European universities was accomplished informally, through application to a faculty member and then through an oral test in the classical languages.[5]

Harvard College, in 1642, published the earliest statement on entrance requirements in the United States. The only specified entrance examinations were in Greek and Latin. The candidate proved his academic competence by meeting in conference with a college official. Late in the eighteenth century, a few colleges added tests in mathematics. Most examinations were oral and were known to last all day. There was no consultation between colleges on entrance requirements.[6]

During the first decade or two of the nineteenth century there was a move to make admission requirements more specific and more quantitative.[7] By 1850, written examinations were used. Each college prepared, administered and graded their own tests. In 1867, Amherst

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[4] Claude M. Fuess, "College Entrance Requirements," Encyclopedia Americana (1959 ed.), VII, 260.

[5] *Ibid.*, 261.

[6] *Ibid.*

[7] W. Lloyd Sprouse, "Colleges and Universities--Admission and Registration," Encyclopedia of Educational Research, (rev. ed.), Walter S. Monroe, editor (New York: Macmillan Company, 1952), p. 262.

College established a requirement in English grammar. Harvard in 1874 announced the addition of a short admission test in English composition.[8]

Charles W. Eliot, after becoming president of Harvard in 1869, turned his attention to revising the entire philosophy of entrance requirements. He emphasized the importance of science, English literature and American history. By the close of the nineteenth century many American colleges had adopted Eliot's recommendation for admission requirements. This, of course, was to have a great influence on the curriculum of the secondary schools of the United States.

Variation from one college to another was the common pattern for admission as it is today. In an effort to bring some semblance of order out of confusion, the College Entrance Examination Board (CEEB) was established in 1900. The Board, sponsored by 12 leading colleges, was the result of the efforts of Charles W. Eliot, Nicholas Murray Butler, and other leading educators.

The function of the Board was to prepare, read, and grade entrance examinations, reporting the results to both member colleges and candidates. The Board helped to improve scholastic standards and make admission procedures systematic and consistent.

Early examinations were limited in the subject matter which was included, were very time-consuming to take, and tended to be subjective in nature. Modern-day examinations are broader in scope, less time-consuming, and more objective.[9]

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[8] Fuess, loc. cit.

[9] Ibid.

Also, "as various patterns of college entrance requirements developed, there was a slow shift from almost absolute prescription to a policy of considerable freedom of elections."[10] This may have been due to the growth in popularity of the progressive education movement.

Major selection methods remained relatively stable throughout the first part of the twentieth century, but a new emphasis and direction became evident after World War II.[11] The massive entrance of World War II veterans into the universities had a tremendous impact on the policies of institutions of higher education.

In 1947 the Educational Testing Service (ETS) was established to combine several entrance examination programs. This eliminated much duplication and waste. The ETS has the responsibility of preparing tests used by the College Entrance Examination Board.

Even though a great deal of progress has been made in developing improved college entrance requirements, uniformity and finality in the delicate business of appraising applicants have not been reached. Such qualities as motivation, perseverance, and morale cannot be accurately measured at this time.[12]

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[10] Sprous, op. cit., p. 263.

[11] Laurence F. Morris, "An Examination of Pre-admission Selection with Reference to Methods, Theories, and Trends as Related to Four-year Degree-Granting Institutions of Higher Education in the United States," (unpublished Doctor's field study, University of Colorado, 1965) Dissertation Abstracts, XXVI (April, 1966), 5825.

[12] Fuess, loc. cit.

Intellectual vs. Non-intellectual Factors

Intellectual factors are those characteristics which are associated directly with the academic process. Aptitude-achievement test scores, course grades, and high school or university grade-point averages are examples of studies conducted related to intellectual factors.[13] Non-intellectual factors are those non-academic aspects which relate to personality, motivational, and attitudinal measures of individuals. There is a slight trend to non-intellectual predictors and criteria.[14]

Yonge sees withdrawal from the university as well as withdrawal from any situation as primarily a psychological problem.[15] As such, withdrawal from the university would be concerned primarily with non-intellectual factors. Fishman points out that when academic ability was held constant, motivational, attitudinal, and personality factors tended to make the difference in university success or failure.[16]

While the importance of non-intellectual factors is recognized, this review of literature will be concerned only with intellectual factors. There is still a great need for further study of intellectual factors as they relate specifically to prediction of success in the colleges of business.

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[13] Fishman and Pasanella, *loc. cit.*

[14] *Ibid.*, 299.

[15] George D. Yonge, "Students," *Review of Educational Research*, XXXV (October, 1965), 254.

[16] Fishman and Pasanella, *op. cit.*, 304.

Global vs. Differential-Type Studies

Global studies are those studies which relate to general criteria of overall or comprehensive academic excellence. Criteria are based on all subject-matter areas and are not focused on any specific field. About 95 per cent of all studies which have been reported in the literature were of the global-type.

Differential studies involved the use of specific criteria such as grades in particular courses or curriculums and focused on a specific field. The differential model of college selection was most appealing to those institutions which were more concerned with guided admission than with selection per se. Differential prediction was more concerned with the individual than with the "average" student.[17]

Just as students vary greatly, so do institutions of higher education. Student selection is primarily a problem of putting a student in the proper university environment.[18] One of the major variables in the university is the specific college in which the student intends to major. Basic differences in academic programs among the College of Engineering, the College of Physical Education, the College of Business, and other colleges within one university are easily recognized. In fact, it may be that the colleges of the same discipline at different universities are more alike than the different colleges on the same campus.

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[17] Ibid., 299, 300, 307.

[18] Yonge, op. cit., 255.

Recognizing these basic disciplinary differences among colleges, it was logical to assume that different intellectual factors would contribute to success in different colleges. Substantiating this point, Winward drew the conclusion from a study of students in different colleges at Brigham Young University that "different kinds of abilities are needed for success in the different courses." This conclusion was based on the variations among correlations with selected variables in the colleges studied.[19]

Parker found that "higher correlations were obtained when one predicted a specific criterion such as History 170 (the American Heritage course) than when one predicted a more general criterion such as all social science grades."[20]

Difficulty was encountered in attempting to predict grades in specific subject-matter courses from achievement tests. The greater unreliability of a single grade was probably the cause of this difficulty.[21]

There would be value in having knowledge of the specific skills and abilities needed for academic success in specific programs.[22]

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[19] Edward J. Winward and Lynn Owens, "The 1965-66 ACT Research Service Report," B.Y.U. Counseling Service, Provo, Utah, Duplicated Report, February 4, 1966, p. 32.

[20] Clyde A. Parker, "The Value of Specific Prediction by Multiple Prediction in Specific Colleges of Brigham Young University," _Research and Discussion Papers_, I (1963).

[21] Fishman and Pasanella, _op_. _cit_., 301.

[22] Winward and Owens, _loc_. _cit_.

The merit of differential-prediction of collegiate academic success as an approach of investigation is open to question. A major purpose of this study was to investigate this question.[23]

II. GENERAL SUCCESS IN THE UNIVERSITY LOWER-DIVISION

High school performance has the highest predictive value of any criteria used in predicting university success. Fishman and Pasanella reported that 263 studies found that high school performance correlated approximately .50 with university grade point average computed during the freshman year.[24]

High school performance usually was expressed as overall grade point average or as rank in the graduating class. Many universities included some standardized aptitude and/or achievement tests as part of their selection measures. Multiple correlational studies using high school record plus an aptitude test found a median correlation of .64 between these two variables and global college criterion.[25]

High School Performance

Grade point average. There are several aspects of high school grade point average which should be discussed. First, high school average has been considered to be a good predictor of success because of its multidimensional nature which was assumed to reflect scholastic ability, motivation, and the development and utilization of skills relevant to scholastic performance.[26]

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[23] Fishman and Pasanella, *op. cit.*, 307.

[24] *Ibid.*, 300.

[25] *Ibid.*, 301.

Gallant found that the mean high school grade point average of all students in his study was .54 points higher than their mean university grade point average. This indicated that, in general, grades fell an average of one-half letter (e.g., from B to B-) in the university.[27]

Generally, mean high school grade point averages were lower in the larger high schools. Gallant also found that lower mean high school grade point averages accompanied greater per-pupil expenditures by the school district.[28] Quality of instruction and variations in grading were also problems which must be faced when considering the grade point average as a predictor of success.

Rank. There was little agreement as to the superiority of either rank or grade point average over each other as a predictor of University success. Kramer and Leaver found rank in the high school graduating class to be the best single predictor of collegiate success.[29] Campbell found quartile rank in the high school graduating class was consistent with results found using high school grade point average.[30]

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[26] Edmond Marks and Joseph E. Murray, "Nonadditive Effects in the Prediction of Academic Achievement," Educational and Psychological Measurement, XXV (Winter, 1965), 1097.

[27] Thomas F. Gallant, "Academic Achievement of College Freshmen and its Relationship to Selected Aspects of the Student's Background," (unpublished Doctor's field study, Western Reserve University, 1965) Dissertation Abstracts, XXVI (May, 1966), 6468.

[28] Ibid.

In any event, universities use high school rank as a means of predicting academic success and screening prospective applicants. The acceptable rank which the student must attain varied from the upper one-fifth to the upper four-fifths. Students who fell below this designated standing were usually required to achieve a satisfactory score on a specified entrance examination.[31] Of course there are some universities which accept all students regardless of rank.

Just as there were problems in using high school grade point average as a predictor of university success, so too were there problems in using high school rank. These problems relate to the size of the high school class, variations in the quality of instruction,[32] and variations in the difficulty level of different courses.

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[29] Kramer, loc. cit.; Thomas E. Leaver, "The Prediction of Academic Achievement of Freshman Business Students at Saint Joseph's College," (unpublished Doctor's field study, Temple University, 1965) Dissertation Abstracts, XXVI (September, 1965), 1429.

[30] Joe W. Campbell, "Factors Related to Scholastic Achievement (Louisiana State University's 1963-64 Freshman Class)," (unpublished field study, Louisiana State University, 1965) Dissertation Abstracts, XXVI (February, 1966), 4360.

[31] Walter A. Lunden, "The American College," Encyclopedia Americana (1959 ed.), I, 505.

[32] Lewis R. Aiken, "Rank in High School Graduating Classes of Various Sizes as a Predictor of College Grades," The Journal of Educational Research, LVIII (October, 1964), 56.

Aiken reported that as median class size increased, mean high school rank decreased. He also reported that "the majority of investigators found that the size of high school graduating class is not related to freshman quality-point ratio."[33]

Hoyt found that high school rank was as good a predictor for students from small high schools as for students from large high schools. But, he found that students from smaller high schools tended to get lower college grades. Also their grades tended to be over-predicted.[34]

Conant recommended that students should not be ranked on the basis of all courses taken since many students enroll in easy courses to obtain a high ranking in their high school graduating class.[35]

It was suggested by Kramer that reported rank in class as a criterion for admission to the university should be considered individually by secondary schools.[36] This was recommended because of the wide variations from one high school to another.

Grades. There was little reported in the literature pertaining to the correlation of grades in specific high school courses with the overall university grade point average or with specific university courses.

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[33] *Ibid*., 56-57.

[34] Donald P. Hoyt, "Size of High School and College Grades," *Personnel and Guidance Journal*, XXXVII (April, 1959), 573.

[35] James B. Conant, *The American High School Today* (New York: McGraw-Hill Book Company, Inc., 1959), 66.

[36] Kramer, *op. cit*., 3576.

In a study conducted by Boyce[37] the following correlations with university grade point average were reported:

High school subject	r
English	.444
Mathematics	.350
Social Studies	.362
Natural Science	.324

Gallant found that "student achievement in all high school English courses correlated higher (.544) with college G.P.A. than did total achievement in social studies, mathematics, or science." He also found that "high school and college English grades correlated (.539) more highly than did grades in social studies, mathematics, or science."[38]

It was found by Anderson that high school bookkeeping and shorthand grades are not good predictors of success in university English and social studies.[39]

Units of study. Normally admission requirements stipulate that the candidate must have completed 15 or 16 units of study in an accredited high school or similar institution. A unit is a subject studied in high school for one school year. Normally these credits must be distributed in approximately six fields. The following is a typical high school preparatory program: four years of English; one or two years of a foreign language; one or two years of history, ancient, modern, or American; one or two years of mathematics which would include algebra and geometry; and one or two years of science such as physics or chemistry. The remaining hours are filled with electives in such subjects as manual training, typewriting, and home economics.[40]

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[37] Richard W. Boyce and R. C. Paxson, "The Predictive Validity of Eleven Tests at one State College," Educational and Psychological Measurement, XXV (Winter, 1965), 1145.

[38] Gallant, loc. cit.

[39] Esther E. Anderson, "The Effectiveness of High School Bookkeeping and Shorthand Grades as Indicators of College Success," The National Business Education Quarterly, XXXI (Fall, 1962), 6.

Gallant found as student ability increased, so did the number of years of study of high school mathematics, science, and foreign language. In social studies an inverse relationship appeared. He also found "in the below-average ability group (41-50 percentile), the positive relationships between college G.P.A. and the number of years of study of high school mathematics, science, and foreign language were especially high. This (high, positive relationship) was not consistently true in other subject-matter areas for other ability groups."[41]

It was reported by Campbell that those students with four units of high school English and those with three or more units of mathematics tended to do better in the university than those with fewer units. He found an inverse relationship between the number of high school vocational courses and university achievement.[42]

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[40] Lunden, *loc. cit.*

[41] Gallant, *loc. cit.*

[42] Campbell, *loc. cit.*

The findings of Campbell and Gallant pointed to a relationship between high school course work preparation and success in university study. It appears that English, mathematics, and science are the best preparation for general success in the university.

In opposition to the latter point of view and, as partial justification for the recommendation that business courses be included in the college-bound student's high school preparation, the Policies Commission for Business and Economic Education have made the following statement:

> After all, scholastic success depends largely upon the industry and native ability of the student--not upon any particular combination of subjects studied.[43]

It was clearly evident that this question required further study.

In relation to the high school major, Sterrett found that continuing university students tended to be students who had majored in a high school college-preparatory program. Those students who withdrew from the university tended to major in high school agriculture, business or shop and technical programs.[44]

The question was raised by Hosler as to whether or not high school students with business credits would be accepted by colleges and universities. It was found that 52 per cent of 147 institutions of higher education studied would allow 5 or more business credits for admission within the usual 16-unit program. Only 15 per cent of the institutions required the full 16 units to be in the traditional college-preparatory subjects.[45]

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[43] Policies Commission for Business and Economic Education, "Business Education for the College-bound Student," Business Education Forum, XVIII (May, 1964), 22.

[44] Marvin Deen Sterrett, "Continuation and Withdrawal in a Select Group of Arkansas College Freshmen," (unpublished Doctor's field study, George Peabody College for Teachers, 1960), Dissertation Abstracts, XXI (February, 1961), 2164.

Testing Program

There are three major types of tests used to predict success in the university: (1) intelligence tests, (2) achievement tests, and (3) scholastic aptitude tests.

Intelligence tests.

Fishman indicated that intelligence tests have not often been used as university selection devices because they have proven less satisfactory than tests designed to measure scholastic achievement.[46]

In his study of business education majors, Bailey found a .44 relationship between I.Q. and university grade point average.[47] Boyce and Paxson found that intelligence and grade point average computed at the end of the first quarter of university work correlated .64 using the California Test of Mental Maturity.[48]

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[45] Policies Commission for Business and Economic Education, *op. cit.*, 21.

[46] Fishman and Pasanella, *op. cit.*, 300.

[47] Rubelia Johnson Bailey, "The Relationship of Educational Background, Socio-Economic Status, Level of Aspiration, and Intelligence to Success in Business Education," *The National Business Education Quarterly*, XXXV (Fall, 1966), 7.

[48] Boyce, *loc. cit.*

Students with an I.Q. of 130 and over tended to remain in the university at least through the freshman year.[49]

Achievement tests. Sixty-two studies of the relationship between scores on English or reading tests and freshman grade point average produced results varying between .13 and .64, with a median correlation of .47.[50]

The Cooperative English Test (mechanics of expression) differentiated significantly between persisters and non-persisters in college. There was no significant difference between the groups on the Cooperative Reading Tests (vocabulary and comprehension).[51]

Scholastic aptitude tests. About 54 per cent of 740 colleges and universities surveyed in the United States indicated that they used College Entrance Examination Board admission tests, while 13 per cent used the American College Tests and 10 per cent of the university used some other type of test. An interesting finding was that one-fourth of the universities used no admission test.[52] Since this survey was conducted in 1962, it is very likely that these figures have changed somewhat. This was particularly to be expected since the American College Test has only recently (1950's) entered the field but has been enjoying increasing popularity.

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[49] Merrill Russell Murray, "A Comparison of Selected Factors in the Precollege Experiences of those Students Who Drop Out of a Technological Institution and their Classmates Who Continue," (unpublished Doctor's field study, Indiana University, 1960), Dissertation Abstracts, XXI (March, 1961), 2536.

[50] Fishman and Pasanella, loc. cit.

[51] Anne Constance Lembesis, "A Study of Students Who Withdrew from College During their Second, Third, or Fourth Years," (unpublished Doctor's field study, University of Oregon, 1965), Dissertation Abstracts, XXVI (February, 1966), 4339.

[52] Jane Gammardella, "Survey of College Entrance Requirements," The Balance Sheet, XLIII (April, 1962), 354.

The average correlation of scholastic aptitude tests with university grade point average was .47.[53] Kunhart and Olson reported that the American Council on Education Psychological Examination (ACE) did not significantly predict success for college students in specific courses. The courses examined were Introductory Psychology, English Composition, Remedial English, Remedial Reading, Introductory Chemistry, Elementary Algebra, Intermediate Algebra, Introductory Biology, and Introductory Business Mathematics. These findings were confirmed by 110 reported studies from 1945 to 1959.[54]

In support of these findings on the relatively low value of the scholastic aptitude test in predicting grades in specific courses, Pierson found that the high school teacher's rating of the student's general ability to do college work was equal to the Ohio State Psychological Examination and the ACE Psychological Examination.[55] Also it was found by Astin that scores on scholastic aptitude tests were of little value in predicting academic achievement of high ability students in university work.[56]

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[53] Fishman and Pasanella, loc. cit.

[54] William E. Kunhart and Eugene V. Olson, "American Council on Education Psychological Examination Scores as Predictors of Success in Academic College Courses," The Journal of Educational Research, LVII (July-August, 1965), 515.

[55] Leroy R. Pierson, "High School Teacher Prediction of College Success," Personnel and Guidance Journal, XXXVIII (October, 1958), 145.

The American College Test was in use at the Brigham Young University at the time of this investigation and was therefore considered in greater detail than the other scholastic aptitude tests.

The American College Test battery consists of four tests each averaging 45 minutes in length. The test battery represents the fields of English, mathematics, social science, and natural science. It is used for admission, scholarship, guidance and placement purposes. The tests in English and mathematics were constructed for use in placing students in freshman English and mathematics classes so that they will have the greatest possible opportunity for success. The ACT composite score provides an overall estimate of the student's general ability to succeed in college.

The ACT mathematics test is one of general mathematical reasoning ability and includes some of the formal skills and concepts taught in the first three years of high school mathematics. While it is a measure of mathematical ability, it is also largely a measure of the student's achievement in high school mathematics courses.

The ACT English test is primarily a measure of appropriateness and effectiveness of written expression. A majority of the items are concerned with diction, style, phraseology, form, and organization.

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[56] Alexander W. Astin, "The Use of Tests in Research on Students of High Ability," Journal of Counseling Psychology, XI (Winter, 1964), 401.

The ACT social science and natural science tests primarily measure ability to reason and do problem solving associated with these fields.[57]

Brown and Wolins, after investigating the American College Test, concluded that it was a good measure of general scholastic aptitude. They also concluded that the subtests were probably not difficult enough and therefore have a restricted range of scores. The mathematics and English subtests are weak in the upper ranges.[58] Lembesis found the high school percentile rank and the American College Test composite scores have high predictive value for success in the university.[59]

The following comparison shows correlations between the ACT and university grade point average obtained in three different studies:[60]

ACT Test	Study Number 1	Study Number 2	Study Number 3
English	.64	.39	.31
Mathematics	.47	.42	.24
Social Science	.50	.34	.31
Natural Science	.46	.39	.21
Composite	.57	.50	Not Available

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[57] Graduate Education Course 560, "Achievement Tests," (Handout received in Tests and Measurements Class, Brigham Young University, Provo, Utah, 1964), p. 4.

[58] Frederick G. Brown and LeRoy Wolins, "An Empirical Evaluation of the American College Testing Program," Personnel and Guidance Journal, XLIII (January, 1965), 456.

[59] Lembesis, loc. cit.

[60] Boyce, op. cit., p. 1145-46; Paul A. DeSena and Louise A. Weber, "The Predictive Validity of the School College Ability Test (SCAT) and the American College Test (ACT) at a Liberal Arts College for Women," Educational and Psychological Measurement, XXI (April, 1965), 1151.

The ACT alone predicted about 35 to 50 per cent of the variation in first semester college grades. The ACT and high school rank together predict about 45 to 65 per cent.[61]

DuBois studied students who persisted, withdrew, and transferred from the university. He found significant differences between the withdrawal and transfer groups both on the ACT mathematics and the ACT social science and between the persisting and withdrawal groups on the ACT mathematics.[62]

It was reported by Stansberry that the American College Test revealed the percentage of students from the total group who would not succeed but not the precise students who would fail in the first year of university work.[63]

In a study conducted by Guyton it was found that about one out of four students who obtained a composite score of 14 or below on the ACT performed successfully in a university during the first semester.[64] This is the only study that was found in the literature which attempted to specify a cut-off ACT score below which university failure was likely. There is great need for additional studies of this nature.

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[61] James M. Foster and David G. Danskin, "The American College Test (ACT) Tested Three Ways," Personnel and Guidance Journal, XLIII (May, 1965), 904.

[62] Lloyd V. DuBois, "A Study of Factors Related to Persistence and Withdrawal Among Sophomore Students in the College of Education at Oklahoma State University," (unpublished Doctor's field study, Oklahoma State University, 1965), Dissertation Abstracts, XXVII (July, 1966), 50A-51A.

[63] C. W. Stansberry, "A Comparative Study of First Year Achievement as Related to Predicted Achievement of Freshmen Enrolled in Elementary Education at Frostburg State College," (unpublished Doctor's field study, Pennsylvania State University, 1965), Dissertation Abstracts, XXVI (October, 1965), 2028.

Sex

The sex of an individual appears to have some bearing on the probability of a student achieving scholastic success. Females achieved significantly higher grade point averages than males according to Barton.[65] Lembesis reported that more females than males tend to voluntarily withdraw from the university. More males than females tend to involuntarily withdraw.[66]

Limiting Factors

Winward has pointed out that the following factors may result in lower correlations for prediction formulas: (1) restricted range of abilities (selective admissions), (2) restricted range of grades, (3) grades based on teacher-made tests rather than departmental tests, (4) grades based on essay examinations (less reliable), (5) inconsistent grade distributions due to determinations being made individually by instructors, and (6) presence of large number of non-academically oriented students.[67] It would be necessary to keep all of these limitations in mind as success in the university is studied.

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[64] Walter R. Guyton, A Study of the Freshmen Admitted to the University of Alabama in the Fall, 1963 and Fall, 1964 Who Scored Low on the American College Testing Program Examination," (unpublished Doctor's field study, University of Alabama, 1966), Dissertation Abstracts, XXVII (November, 1966), 1294A.

[65] Joseph Elbert Barton, "A Study of Selected Environmental and Personality Variables Associated with High and Low Academic Achievement of University Freshmen," (unpublished Doctor's field study, University of Alabama, 1964), Dissertation Abstracts, XXV (June, 1964), 7072.

[66] Lembesis, loc. cit.

III. GENERAL SUCCESS IN THE UNIVERSITY UPPER-DIVISION

Lower-Division Course Preparation

Strangely enough, there was little reported in the literature on the relationship of lower-division course preparation to general success in upper-division course work. Success in the lower-division appears to be a vital area in determining whether or not the student graduates.

Lewis found that none of the pre-university variables (high school rank, high school grade point average (G.P.A.), number of high school physical science units, and college entrance test composite percentile score) were significant for predicting achievement beyond the sophomore year in college. He found that previous college G.P.A. yielded significant predictions of G.P.A. beyond the sophomore year.[68] Jacobson[69] found the following in his correlation study with first and fourth year university G.P.A.:

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[67] Winward and Owens, *op. cit.*, p. 20.

[68] John W. Lewis, "Pre-College Variables as Predictors of Freshman, Sophomore and Junior Achievement," *Educational and Psychological Measurement*, XXIV (February, 1964), 356.

[69] Sol Jacobson, "Judicial Review of College-Admission Policies," *Journal of Higher Education*, XXXIV (1963), 436.

	Grade Point-Index Correlation First Year	Fourth Year
High school G.P.A.	.50	.20
Scholastic Aptitude Test	.45	.45
Combined score of above two	.55	.46

Transfer Status

There was some disagreement in the literature as to the impact of transfer status on upper-division grade point average. Two investigators reported no significant difference in grade point average between transfer students from junior colleges and native university students.[70] One of these authors, however, reported the grade point average of most transfer students decreased after one semester at the university. He also reported that junior college transfer students at the university made significantly poorer academic adjustment than other students.[71] Two other studies reported that the junior college student is less likely to do as well as the native university student during the junior and senior years.[72] One of these authors, Robert Place reported that junior college students who entered state colleges as juniors had a significantly higher scholarship average than was held by the four-year students at the beginning of their junior year.[73] The other researcher, John Hills, found that the junior college students' grades will probably be lower than the grades of the native student.[74] Both Hills and Place reported that the junior college transferee will not do as well in the university as he did in the junior college, but he is likely to academically recover. Both Hills and Place found that the junior college student will be less likely to graduate than the native university student.[75]

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[70] Henry Joseph Osner, "A Comparison of the Academic Success of Native Students and Junior College Transfers Who Graduated From Four California State Colleges in 1959," (unpublished Doctor's field study, University of Pacific, 1961), Dissertation Abstracts, XXI (June, 1961), 3691; William Young, "Admission of the Transfer Student," Personnel and Guidance Journal, XLIII (September, 1964), 60.

[71] Ibid.

[72] John R. Hills, "Transfer Shock: The Academic Performance of the Junior College Transfer," The Journal of Experimental Education, XXXIII (Spring, 1965), 209; Robert I. Place, "The Academic Successes of Junior College Transfer Students in the California State College Business Division," The National Business Education Quarterly, XXXI (Fall, 1962), 51.

Hills also found that it will probably take the junior college student longer to graduate than the native student. The study also reported that the junior college transfer student is more likely to have problems in quantitative subjects. And he will not do as well academically as the transfer student from other types of institutions of higher education.[76]

In reviewing business junior college preparation, Place found that "a background of business courses in the junior college did not have an affect on competitive grades in the state college business courses." Also, "non-business students from the junior college appeared to be superior to those who were junior college business majors in academic accomplishments."[77]

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[73] Hills, loc. cit.

[74] Place, loc. cit.

[75] Ibid.

[76] Hills, loc. cit.

Other Factors

Bloom reported that among students who change major fields of study, 48 per cent graduated; while only 32 per cent of those who did not change major fields graduated.[78]

It was found by Reed that the tendency to persist in college is accompanied by an increase in the number of academic hours carried.[79]

It was significant to note that there were no studies which were concerned with students repeating college courses in which low grades had been received. It is likely that there is some relationship between how often a student repeats a course and his eventual success in the university. This question needed further investigation.

IV. SUCCESS IN COLLEGES OF BUSINESS

A limited number of studies have been conducted which relate specifically to success in colleges of business. Other studies which relate to the College of Business at Brigham Young University are discussed in Section VI of this chapter.

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[77] Place, loc. cit.

[78] Benjamin S. Bloom, and Harold Webster, "The Outcomes of College," Review of Educational Research, XXX (October, 1960), 322.

[79] Stanley R. Reed, "Factors in Retention of University of Arkansas Residence Hall Freshman," (unpublished Doctor's field study, University of Arkansas, 1965), Dissertation Abstracts, XXVI (August, 1965), 833.

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Predictors of Success in the Colleges of Business

Two separate studies were conducted to show the relationship between high school performance as measured by high school G.P.A. or high school rank and university G.P.A. Also the scholastic aptitude test was correlated with university G.P.A. Group A were secretarial majors. Group B were college of business students in general. The correlation ratios found in these studies follow:[80]

	G.P.A. University	
	Group A	Group B
High School	.615	-
High School Rank	-	.57
Scholastic Aptitude-Verbal	.397	.28
Scholastic Aptitude-Math	.433	.45

Comparison of these correlation ratios reveal similar results in both studies.

In a study conducted by Watley and Martin, the academically successful student was defined as the student who ranked in approximately the top 25 per cent of the university class after the first year's work. The academically marginal student was defined as the student who ranked in approximately the bottom 25 per cent of the class at the end of the first year. Significant differences at the .001 level were found between these two groups on the verbal and mathematics subtests of the Scholastic Aptitude Test. Highly significant differences were also reported among groups on certain subscales of the Guilford-Zimmerman Temperament Survey, a survey of non-intellectual factors.[81]

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[80] Roscoe J. Allen, "An Analysis of the Relationship Between Selected Prognostic Measures and Achievement in the Freshman Program for Secretarial Majors at the Woman's College of the University of North Carolina," The National Business Education Quarterly, XXXI (Fall, 1962), 5; Donivan J. Watley and Jack C. Merwin, "The Effectiveness of Variables for Predicting Academic Achievement for Business Students," The Journal of Experimental Education, XXXIII (Winter, 1964), 191.

As Chansky has pointed out there are different explanations for success in different courses of study. Different personalities, abilities, and achievements are required in colleges within a university.[82]

Specialized Areas in the College of Business

Accounting. Accounting students and high school bookkeeping teachers believe that bookkeeping instruction in high school helps in the study of collegiate accounting. Accounting teachers do not prefer students who have had bookkeeping instruction.[83] There was, however, agreement in several studies that a student who receives above-average grades in high school bookkeeping received average or above-average grades in college accounting courses.[84]

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[81] Donivan J. Watley and H. T. Martin, "Prediction of Academic Success in a College of Business Administration," Personnel and Guidance Journal, LXI (October, 1962), 151-53.

[82] Norman M. Chansky, "Aptitude, Personality and Achievement in Six College Curricula," Educational and Psychological Measurement, XXV (Winter, 1965), 1123.

[83] Edna H. Barbour, "The Effect of the Study of High School Bookkeeping upon Achievement in Elementary College Accounting," The National Business Education Quarterly, XXV (Fall, 1956), 12.

Barbour found that average or below-average grades in high school bookkeeping have no predictive value in college accounting.[85] On the other hand, Dowell found that students who received average or below-average grades in bookkeeping received below-average or failing grades in beginning college accounting.[86]

According to the findings of Kennedy, accounting students with an academic pattern of high school subjects maintained higher achievement records in a college of business than accounting students with either a business vocational or a non-business vocational pattern of high school subjects.[87]

Barbour found no correlation between the accounting grade and the number of semesters of bookkeeping taken. Also there was no correlation between the accounting grade and the years elapsing between the study of bookkeeping and accounting.[88]

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[84] Ibid.; Linda Lee Dowell, "A Comparison of the Performance of High School Seniors and College Students in a First Semester College-Level Accounting Course," The National Business Education Quarterly, XXXIV (Fall, 1965), 15; Tora M. Larsen, "A Study of Student Personnel Records at East Carolina College as they Relate to Prediction in Elementary Accounting," The National Business Education Quarterly, XXVII (Fall, 1958), 46-47; Jack E. Theige, "An Analysis of the Prognostic Value of High School Bookkeeping to Elementary College Accounting," The National Business Education Quarterly, XXVII (Fall, 1958), 74.

[85] Barbour, loc. cit.

[86] Dowell, loc. cit.

[87] Calvin E. Kennedy, "Differences in Academic Achievement in an Undergraduate College of Business Among Students Having Different Backgrounds of High School Preparation," Journal of Business Education, XXXIX (February, 1964), 207.

There was disagreement in the literature on the value of test data in predicting success in the study of accounting. Foster and Danskin found the following correlations between the American College Test and accounting grades for both men and women: ACT English .38, ACT Mathematics .39, ACT social science .45, and ACT natural science .36.[89]

Royer found that the ACE examination, an arithmetic test, and several non-intellectual factors could be used to predict accounting grades. Prediction of these grades were accurate within one letter mark for two-thirds of the group under study.[90]

In contrast, Larsen found ACE score, high school average and freshman English composition grade were not significant predictors of achievement in elementary accounting.[91] Landweher also found that the ACE, along with the reading test, and a handwriting test had little value in predicting success in the study of accounting.[92]

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[88] Barbour, loc. cit.

[89] Foster and Danskin, op. cit., 908.

[90] J. Everett Royer, "Selection and Use of Certain Factors Significant in Predicting Achievement of Students in First-Semester Accounting at the University of Miami, 1950-1953," The National Business Education Quarterly, XXVI (Fall, 1957), 56.

[91] Larsen, loc. cit.

[92] Bernard J. Landweher, "An Analysis of Selected Factors Related to Success in the Study of College Accounting in an Attempt to Establish Minimum Requirements for Accounting Students at West Liberty State College, (unpublished Doctor's field study, University of Pittsburgh, 1963), Dissertation Abstracts, XXV (October, 1964), 2280-81.

Grades earned in beginning accounting courses are the best predictors of success in the study of accounting as a major field. Landweher found that a majority of the colleges and universities which favor the establishment of prerequisites for the accounting major believe that grades or grade averages in beginning accounting courses should be used as the prerequisite.[93]

Business Education. Kennedy found

> female office administration majors who completed an academic pattern of high school subjects tend to be superior in college achievement to female office administration students who completed a business vocational or a non-business vocational pattern of high school subjects.

He further reported that "female business education majors with a business vocational pattern of high school subjects tend to be superior in college achievement to female business education students with a non-business vocational pattern of high school subjects."[94]

"No relationship was found to exist," by Sanders, "between students' high school experiences in learning shorthand and what they later achieved in college." No relationship was found between ACE percentile rank and years of shorthand taken in high school. There was a significant relationship found between ACE percentile rank and achievement in college shorthand grades.[95]

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[93] Ibid.

[94] Kennedy, op. cit., 206-207.

[95] Celene Honeycutt Sanders, "A Study of the Relationship Between Certain Radford College Students' ACE Scores, Years of Shorthand in High School and Achievement in Shorthand," (unpublished Master's thesis, Virginia Polytechnic Institute, Blacksburg, 1961), The National Business Education Quarterly, XXI (Fall, 1962), 58.

Russon found business education students to be significantly superior in English but significantly inferior in natural science, social science, and mathematics when compared with other entering freshmen. "In their average high school grades, business education students were significantly superior to the average university student." Grade point average in required business education subjects correlated .66 with high school grades, .62 with English grades, and .40 with mathematics grades.[96]

Allen concluded that the most important factor necessary for success of secretarial students is achievement in high school as indicated by the grades received.[97] Russon supported this statement in her conclusion that "contrary to the beliefs of many general college counselors, there is a great similarity between the predictive formulae for general college achievement and business education achievement."[98]

Other business subjects. The student's average grade received in high school mathematics was found to have the highest relationship with performance in introductory statistics.[99]

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[96] Allien R. Russon, "The Prediction of Scholastic Achievement of Business Education Majors at the College Level," *The National Business Education Quarterly*, XXIII (Fall, 1954), 75.

[97] Allen, *loc. cit.*

[98] Russon, *loc. cit.*

[99] Leo Brent Eager, "A Multivariate Analysis of Factors Contributing to Student Performance in the Introductory Statistics Course of the Business Administration Curriculum" (unpublished Doctor's field study, University of Washington, 1965), *Dissertation Abstracts*, XXVII (July, 1966), 18A-19A.

In predicting success in an advanced mathematics course in a college of business, a correlation of .45 was found with the prerequisite mathematics course. The grade point average of the students at the time the students were enrolled in the advanced mathematics course showed the highest correlation (.49). Achievement in related subjects or general achievement in college proved to be the best factors to predict success in the advanced business mathematics course.[100]

The following correlations with grades achieved by male students in college algebra were found: ACT English, .40; ACT mathematics, .54; ACT social science,.35; ACT natural science, .27; high school grade, .48; and high school grade and ACT, .62.[101] Another study found a correlation of only .25 between ACT mathematics and grade in college algebra.[102]

Kennedy found the pattern of high school subjects made no significant difference in college achievement for students majoring in management or in general business.[103] The fact that some students had taken the high school general business or economics course had relatively no effect on the scores of a pre-test and post-test administered to a university class in Introduction to Business. Also, Nelson found

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[100] Frances J. Wetzel, "Prognostic Potential of Selected Factors for Predicting Success in Business Mathematics 120 at Northern Illinois University," The National Business Education Quarterly, XXXIV (Fall, 1965), 60-61.

[101] Foster and Danskin, op. cit., 908.

[102] Richard W. Boyce, "The Prediction of Achievement in College Algebra," Educational and Psychological Measurement, XXIV (Winter, 1964), 420.

[103] Kennedy, loc. cit.

> the high school rank or general ability of the student was a more accurate predictor of success in understanding the information presented in the Introduction to Business course than previous knowledge gained in economics and general business courses presented on the high school level.[104]

V. REVIEW OF SELECTED COLLEGES OF BUSINESS

The review of the literature revealed no complete, clear picture of what selection devices and admission standards other colleges of business are using. It was decided to review university catalogs to obtain this information. This phase of the study was limited to those four-year institutions of higher education which have an enrollment of 10,000 or more and are located west of the Mississippi River. These factors tended to closely approximate the profile of the Brigham Young University. The 1966 Supplement to the Encyclopedia Americana was consulted to obtain the names of colleges and universities which met these criteria.[105] A list of 42 institutions was compiled. Because not all of the institutions listed included a college of business, only 34 of the 42 institutions were surveyed. This survey was conducted by reviewing the catalogs of each of the 42 universities.

Seven of the thirty-four colleges of business did not admit lower division students. Two of the seven institutions (Stanford and the University of California at Los Angeles) maintained only graduate business programs. The remaining five colleges of business which only maintained upper division programs in business, stipulated admission requirements. There were varying degrees of selectivity practiced among those colleges of business which admitted lower-division students.

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[104] Robert Eric Nelson, "Business and Economic Understanding of College Freshmen," The National Business Education Quarterly, XXXIV (Fall, 1965), 43.

[105] "Major Colleges and Universities, U.S. and Canada," The Americana Annual (1966), 184-197.

Lower-Division Admission Requirements

High school preparation course work. Only eight of the twenty-seven colleges of business which admitted lower-division students have specified high school preparation which must be completed prior to being admitted to the College of Business. Table I indicates the high school courses required by each of the colleges of business.

TABLE I

NUMBER OF UNITS OF HIGH SCHOOL CREDIT REQUIRED BY SELECTED COLLEGES OF BUSINESS

High School Subject	U. of Wash St. Lo	U. of Texas	U. of So. Cal.	Ore. St. U.	U. of Neb.	U. of Hawaii	U. of Wash.	Iowa St. U.
English	4	3	3	4c	3			
Math	2a	3	2	4c	3	3	e	2.5
Science	1	b	1	2c	d			
For. Lang.	2	b			d			
Social Sc.	2	b	2	3c	d			
Other	4	6	4	1c	5			
Total	15	16	12	14	16	3		2.5

NOTE: See key on following page.

Table I Key:
- a 3 or 4 preferred
- b 4 units to be taken in science, foreign language, and social science
- c strongly recommended
- d 5 units to be taken in science, foreign language, social science
- e high school mathematics courses recommended to prepare for college algebra and calculus

Either three or four units of English were required. Two to four units of mathematics were required. Also required were the following: science, 1 or 2 units; foreign language, 1 or 2 units; social science, 1 to 3 units. Oregon State University strongly recommended that college of business students take one unit of high school typewriting.

High school grade point average. None of the institutions studied stipulated a high school grade point average other than that required for admission to the university.

Upper-Division Admission Requirements

Lower-division preparation course work. A glance at Table LVI in Appendix A reveals a wide variation in the requirements for admission to upper-division in the colleges of business.

Nine of the ten colleges which stipulated specific course requirements, included mathematics and economics among these requirements. Most institutions required six semester hours of economic principles and three to six semester hours of mathematics. The number of semester hours required does not really tell the full story, however. At the University of California at Berkeley the mathematics requirement was calculus and analytic geometry,[106] whereas the University of Kansas required Probability and Matrices or Calculus and Analytic Geometry.[107] Other colleges of business required Mathematics Analysis which included College Algebra and Trigonometry. In some cases only College Algebra may be required by a college of business.

Seven of the nine colleges of business, requiring specific lower-division courses for admission to the college included English and accounting. The usual English and accounting requirement was 6 semester hours. Five colleges of business included a course in statistics.

There were also varying requirements in the general education area. There appeared to be general agreement among those colleges of business which stipulated admission requirements for upper division that general education courses be required. The specific courses and the amount of credit in each discipline differed.

Only one or two colleges of business required a course in introduction to business, business law, or written business communication as required background for upper-division work.

Lower-division grade-point average required. There was general agreement that a "C" average (2.0 on a 4.0 scale) should be attained upon completion of lower-division requirements.

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[106] University of California, "General Catalog for University at Berkeley," (Bulletin from University of California, Berkeley, California, 1964-65), p. 96.

[107] University of Kansas, "School of Business Catalog," (Bulletin from University of Kansas, Lawrence, Kansas, 1965-66), pp. 10-11.

Semester hours of lower-division credit required. Most colleges of business which admitted only upper-division students required approximately sixty semester hours of university credit be completed. Normally this lower-division work was to be completed in a liberal arts college. Special plans for admission to the upper-division college of business which differ from this usual plan are discussed in the section which follows.

Special Plans for Admission to Upper-division College of Business

Several different plans were found for admission to the upper-division of the College of Business. At Washington University in St. Louis, enrollment in either the College of Liberal Arts or the College of Business during the first two years was possible. Students were encouraged to enroll in the College of Business only if they had a strong interest in a particular business career or if they intended to major in Retailing.[108]

At the University of Utah,

> students will maintain dual enrollment in the College of Letters and Science and in the College of Business until they have completed the general education requirements of the university. The minimum cumulative grade-point average required for acceptance of transfers into the College of Business from another college or from dual to single enrollment is 2.0 (C average).[109]

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[108] Washington University, "Bulletin of School of Business and Public Administration," (St. Louis, Missouri, April, 1962), 12.

[109] University of Utah, "General Catalog for University of Utah, 1966-67," (Bulletin of University of Utah, Salt Lake City, Utah), 32.

All first-year business students enroll in the University College at the University of Oklahoma. "No student may enroll in upper-division Business Administration courses while he is enrolled in University College."[110]

Still another plan at the Arizona State University, allows students to be admitted to the College of Business during the first two years. To continue in the third and fourth year professional program, a student must meet certain admission requirements. These requirements include completion of sixty semester hours of university credit with a cumulative grade-point average of 2.0, completion of lower-division business core courses with a 2.0 grade-point average (this includes 6 semester hours of economic principles), and completion of 32 semester hours of general education courses.[111]

VI. BRIGHAM YOUNG UNIVERSITY COLLEGE OF BUSINESS STUDENTS

University Students in General

By way of general background it would be profitable to look at university students in general. In a sample of 2500 students, Seibel found that 41 per cent of the males and 32 per cent of the females attended the university or college during the first year after graduation from high school. Fifty-five per cent of the males and 64 per cent of the females did not attend college.[112] It has been concluded that every student, regardless of his ability level can find an accredited college or university that will admit him.[113]

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[110] University of Oklahoma, "Issue for the College of Business Administration," (Bulletin from University of Oklahoma, Norman, Oklahoma, 1966), 43.

[111] Arizona State University, "Arizona State University General Catalog," (Arizona State University, Tempe, Arizona, 1966-67), 144.

About 18 per cent of the students attended two-year colleges while 82 per cent attended four-year institutions of higher education. "Among students (who enrolled in college) in the highest quarter of academic ability about one-tenth attended two-year institutions. Among students in the lowest quarter of ability nearly one-half attended two-year institutions."[114] Overall, full-time freshman enrollment increased by approximately 42 per cent from 1960-61 to 1964-65. Approximately 58 per cent of the enrolling freshmen were male in both 1960-61 and 1964-65.[115]

In reviewing academic status after one year of college, the following percentages were found:[116]

	Males	Females	Both
In good standing	67	83	75
On academic probation	18	8	13
Academic Dismissal	10	5	8
Withdrawn (non-acad.)	5	4	4
Total percentage	100	100	100

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[112] Dean W. Seibel, "The Relationship of Some Ability Characteristics of High School Seniors to College Attendance and Performance," College and University, XLII (Fall, 1966), 44.

[113] Yonge, op. cit., 257.

[114] Seibel, op. cit., 45, 52.

[115] Yonge, op. cit., 253.

[116] Seibel, loc. cit.

Increasing enrollments have not necessarily resulted in a reduction of academic ability level.[117] Though there are more in the 1960's, university freshmen are as capable as university freshmen of the 1930's. There is some evidence to suggest that they are even more scholastically capable today. In Minnesota, it was found that more of the top high school students scholastically are going on to college.[118]

"Among students who enroll in college about one-tenth of the high-ability group and one-half of the low-ability group are in academic difficulty at the end of the freshman year."[119] The majority of non-returning students are either freshman (38 per cent) or sophomores (33 per cent). On the basis of high school rank and test scores the students as a group were capable of successfully undertaking university work. Many who dropped out would have been able to successfully continue on to receive a degree.[120] This was a tragic loss of human resources.

Ninegar found that the characteristics of students who were suspended were as follows: (1) they were single, (2) were 18 years old upon entering college, (3) three-fourths were in the lower one-half of their high school graduating class, (4) the high school principal rated the student average or lower, (5) one-fourth were below the 50th percentile on an I.Q. test, (6) one-third came from a high school graduating class of forty students or fewer, and (7) one-third had not selected a probable career.[121] Some of these factors should be considered when stipulating admission requirements. Other factors, such as the size of the high school graduating class, are of such a nature that it would be difficult to include them as admission requirements. All of the factors should be considered when counseling with students, however.

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[117] Yonge, loc. cit.

[118] David P. Campbell, "A Cross-Sectional and Longitudinal Study of Scholastic Abilities over Twenty-Five Years," Journal of Counseling Psychology, XII (Spring, 1965), 57.

[119] Seibel, loc. cit.

[120] Joseph Franklin Roberts, "A Study of 1,038 Undergraduate Students Who Did Not Return to the University of Missouri for the 1959 Fall Semester," (unpublished Doctor's field study, University of Missouri, 1960), Dissertation Abstracts, XXI (December, 1960), 1445.

Several studies showed that from 20 to 40 per cent of the entering university class graduated on schedule. The little recognized fact was that 60 or 70 per cent of all students will eventually graduate from some institution of higher education. Most dropouts return to college and most returnees eventually graduate. This evidence depicted the prolonged and sporadic nature of college careers.[122]

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[121] Louis Charles Ninegar, "Academic Suspension at Kearney State College," (unpublished Doctor's field study, University of Nebraska Teachers College, 1965), Dissertation Abstracts, XXVI (July, 1965), 173-74.

[122] Bloom, and Webster, *op. cit.*, 321; Bruce K. Eckland, "A Study of College Dropouts and Graduates Ten Years After Matriculation, With Special Reference to Social Origins and Intergerational Mobility," (unpublished Doctor's dissertation, University of Illinois, 1964), Dissertation Abstracts, XXV (May, 1965), 6307; Frank B. Jex and Reed M. Merrill, "Student Persistence as Revealed in Longitudinal Graduation Studies," College and University, XLII (Winter, 1967), 321.

Brigham Young University Students in General

During the Fall semester of 1966-67 there were slightly over 20,000 students at the Brigham Young University. The ratio was approximately 11,000 men to 9,000 women. The breakdown by class was as follows: Freshman, 5,749; sophomore, 4,759; junior, 4,307; and senior, 3,582. During the freshman and sophomore years there were approximately 450 more females than males, but during the junior and senior years this ratio completely reversed itself. There were almost 1,450 more males than females.

Of the 5,700 new students during the Fall semester of 1966-67, approximately 3,900 were new freshmen and 1,800 were transfer students. Almost 1,400 former students returned to the university. There were about 13,000 continuing students. The transfer students were divided by class as follows: freshman, 430; sophomore, 582; junior, 549; and senior, 57.[123]

It was found that scores on entrance tests which would have placed a student in the 84th percentile in 1956 would place a student now taking the same test in the 40th percentile. This student would not now be eligible for admission. "Entering students this year achieved one full point above the 1965 national mean of top ranking institutions and nearly three points above the 1965 mean of other institutions using the ACT test in the nation."[124] Thus, we can see that students currently entering the Brigham Young University are generally of higher ability than students who were admitted ten years ago.

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[123] "Brigham Young University Summary of Enrollment," Fall Semester, 1965, 1966, p. 1 (Duplicated).

College of Business Students

In the 1963 Fall semester there were 1,251 students enrolled in the College of Business. By the Fall semester 1965, this figure increased to 1,675 students. The increase continued and in the Fall semester of 1966, there were 1,783 students enrolled, of whom 1,331 were men and 452 women. The breakdown by class was as follows: freshmen, 445; sophomores, 385; juniors, 487; and seniors, 466. There were 244 male freshmen, 286 male sophomore, 404 male juniors and 397 male seniors. The large increase in male enrollment during the junior year is of special interest. There were 201 female freshmen, 99 female sophomores, 83 female juniors, and 69 female seniors. The decrease in female enrollment from the freshman to sophomore years is noteworthy.[125]

The Accounting Department during the Fall of 1966 enrolled 493 males and 40 females for a total of 533 students. There was an increase in enrollment in the Accounting Department for each class as follows: 86 freshmen, 109 sophomores, 160 juniors and 178 seniors. The large increase between the sophomore and junior years may have accounted for a major part of the large increase in the total College of Business enrollment.

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[124] "Brigham Young University Faculty Meeting Minutes," February 16, 1967, p. 3. (Duplicated).

[125] "Enrollment Resume 1963-64, (Office of Institutional Research, Brigham Young University, May, 1965), 11.

The Business Education Department had an enrollment of 57 men and 321 women for a total of 378 during the Fall of 1966. The number of students enrolled decreased steadily from the freshman to the senior year, with the largest drop coming between the freshman and sophomore years. There were the following number of males in the business education department by class: Freshman 27, sophomore 11, junior 12, and senior 7. There were 120 female freshmen, 75 sophomores, 68 juniors and 58 seniors.

During the Fall of 1966 there were 655 males and 54 females for a total of 709 students enrolled in the Business Management Department. The total enrollment steadily increased from 133 freshmen to 162 sophomores, 216 juniors, and 198 seniors. The 32 females in the department decreased from 32 in the freshman year to 5 in the senior year.

The Economics Department had a total of 72 students, only two of whom were women. At the same time there were only four business majors in the Statistics Department.

During the Fall of 1966 the effect of the Business Fundamentals Division was just beginning to be felt. During the Fall of 1966 there were only 87 students officially enrolled. By the Spring of 1967 this figure had increased to 623 students.[126]

This increase in enrollment of the College of Business was in line with the national trend. Nationally, freshmen declaring majors in business showed an increase in line with the overall trend of increasing university and college enrollment.[127]

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[126] "Brigham Young University Summary of Enrollment," Spring Semester, 1967, (Duplicated.); Supra pp. 8 et. seq. for further discussion of the Business Fundamentals Division.

During 1965-66 there were 392 students who enrolled in the College of Business at Brigham Young University who also took the ACT test. The mean composite ACT score of 20.6 was equivalent to a percentile rank of 69. In other words, 69 per cent of the 329 colleges and universities that participated in the ACT Research Service obtained lower mean ACT composite scores. A further comparison of ACT scores achieved by College of Business students is found in Table II.[128]

Freshmen who enrolled in the College of Business in 1961-62 and who also took the ACT test attained an average composite score of 19.34. Further details on this group may be found in Table III.

Business students who enrolled in 1965-66 had a mean high school grade point average of 2.67 as compared with an average of 2.97 received by students who enrolled in the college of business during 1960-61. The cause of this decline is not known. Tables IV and V indicate further details.

As can readily be seen from Table VI the College of Business ranks seventh in a group of nine in the overall college grade point average achieved by its entering students as compared with other colleges at the Brigham Young University.

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[127] Yonge, loc. cit.

[128] Winward and Owens, op. cit., pp. 12-13.

TABLE II

COMPARISON OF MEAN ACT SCORES FOR STUDENTS MAJORING IN THE COLLEGE OF BUSINESS WITH STUDENTS MAJORING IN OTHER COLLEGES AT THE BRIGHAM YOUNG UNIVERSITY FOR PERIOD 1965-66 FOR COLLEGE OF BUSINESS

N=392

	English	Mathematics	Social Science	Natural Science	Composite
Business	18.18	20.90	21.06	21.75	20.61
Teacher Ed. Females	20.56	17.43	20.70	20.09	19.83
Teacher Ed. Males	28.00	19.76	21.67	22.18	20.50
Biological Science	20.06	22.47	22.40	24.28	22.42
Skills Improvement	16.78	17.52	18.39	19.28	18.11
Social Science Females	21.27	17.96	22.71	21.29	20.92
Social Science Males	19.57	21.32	23.89	23.48	22.19
Engineering	19.73	24.92	22.74	24.96	23.20
Physical Science	21.59	27.03	24.67	27.04	25.23
Natural Colleges	19.40	19.53	20.29	20.47	20.08
National Universities	20.64	21.32	21.80	22.09	21.60

Source: BYU Testing Office Duplicated Handout

TABLE III

COMPARISON OF FRESHMEN MAJORING IN THE COLLEGE OF BUSINESS WITH THE REST OF THE FRESHMAN CLASS AT THE BRIGHAM YOUNG UNIVERSITY ON SELECTED FACTORS FOR THE PERIOD 1961-62

ACT Test	BUSINESS			FRESHMAN CLASS		
	Mean	Upper Limit Middle 2/3 of Group	Lower Limit Middle 2/3 of Group	Mean	Upper Limit Middle 2/3 of Group	Lower Limit Middle 2/3 of Group
English	17.96	22	13	19.02	22	15
Math	16.76	23	11	17.95	24	12
Social Science	18.40	24	13	19.56	25	14
Natural Science	18.14	24	12	19.77	25	13
Composite	18.11	23	12	19.34	23	15

Source: BYU Testing Office Duplicated Handout

TABLE IV

HIGH SCHOOL GRADE POINT AVERAGE FOR 1960-61 ENTERING FRESHMEN COLLEGE OF BUSINESS

HIGH SCHOOL GPA	FREQUENCY	PERCENTAGE
A	2	1
A-	17	9
B+	15	8
B	55	31
B-	17	9
C+	39	22
C	35	19
N=	180	99

M= 2.976 or B-

SD= .52

Source: BYU Counseling Service Duplicated Report

TABLE V

COMPARISON OF HIGH SCHOOL GRADE POINT AVERAGES FOR STUDENTS MAJORING IN COLLEGE OF BUSINESS WITH STUDENTS MAJORING IN OTHER COLLEGES AT THE BRIGHAM YOUNG UNIVERSITY FOR PERIOD 1965-66

	High School Mean GPA	Lower-Limit for Middle 2/3 of Group	Upper-Limit for Middle 2/3 of Group
Business	2.67	2.08	3.26
Biological Science	2.93	2.32	3.54
Teacher Ed. Females	2.98	2.36	3.60
Teacher Ed. Males	2.75	2.13	3.37
Physical Science	3.31	2.74	3.88
Engineering	3.05	2.49	3.65
Skills Improvement	2.19	1.73	2.65
Social Science Females	2.93	2.34	3.52
Social Science Males	2.81	2.17	3.45
National Colleges	2.10		
National Universities	2.11		

Source: BYU Testing Office Duplicated Handout

TABLE VI

COMPARISON OF OVERALL COLLEGE GRADE POINT AVERAGE FOR STUDENTS MAJORING IN THE COLLEGE OF BUSINESS WITH STUDENTS MAJORING IN OTHER COLLEGES AT THE BRIGHAM YOUNG UNIVERSITY FOR PERIOD 1965-66

	Mean Overall College GPA	Lower-Limit for Middle 2/3 of Group	Upper-Limit for Middle 2/3 of Group
Business	2.26	1.58	3.00
Biological Science	2.44	1.67	3.21
Teacher Ed. Females	2.39	1.64	3.14
Teacher Ed. Males	2.45	1.76	3.14
Physical Science	2.68	1.87	3.49
Engineering	2.25	1.46	3.04
Skills Improvement	1.57	0.76	3.04
Social Science Females	2.39	1.60	3.18
Social Science Males	2.53	1.87	3.38

Source: BYU Testing Office Duplicated Handout

Table VII compared ACT scores received by graduates of the College of Business with the graduates of other colleges at the Brigham Young University. Business graduates compared favorably with respect to composite and mathematics scores but tended to rank lower in scores on the English, social science, and natural science ACT mean scores. Scores of College of Business graduates compared favorably with the scores of all Brigham Young University graduates with the exception of English and social science.

Figure 1 compared the difference in ACT mean scores of College of Business graduates with the 1965 graduates of Brigham Young University, the graduates of the College of Physical and Engineering Sciences, and graduates of the College of Physical Education. College of Business graduates generally scored lower than College of Physical and Engineering Sciences graduates but well above physical education graduates.

Prediction of General Success In the College of Business

Stone found in 1954 that high school grade point average and American Council on Education Psychological Examination total scores were the best predictors of success (.663) in the College of Business (then Commerce) at Brigham Young University.[129]

Winward and Owens found that "the ACT indices can be of considerable value in predicting academic success" under certain

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[129] Joics B. Stone, "Differential Prediction of Academic Success at Brigham Young University," The Journal of Applied Psychology, XXXVIII (February, 1954), 110.

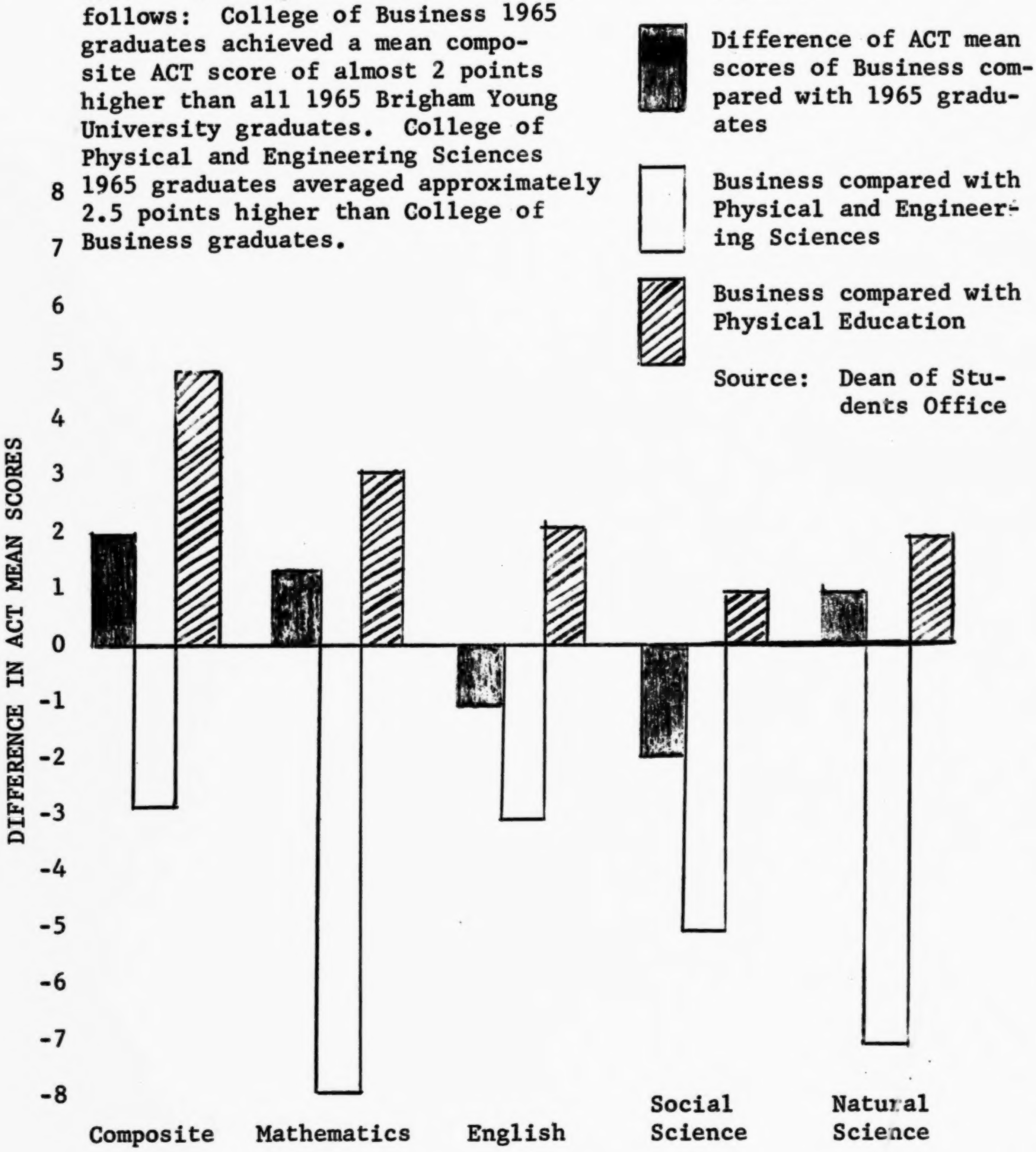
TABLE VII

COMPARISON OF ACT SCORES FOR 1965 BUSINESS GRADUATES WITH OTHER GRADUATES OF THE BRIGHAM YOUNG UNIVERSITY 1965 GRADUATES

		ACT Comp	ACT Math	ACT Eng	ACT SS	ACT NS
Business	M	22.18	19.74	20.23	19.13	18.82
	UL	26	34	26	29	31
	LL	13	9	9	6	7
	Rank In BYU	3	3	6.5	7	7
1965 BYU Graduating Class	M	20.36	18.42	20.87	20.91	18.08
	UL	31	34	30	33	32
	LL	11	2	2	6	4
Biol. and Agricultural Science	M	20.03	29.50	19.73	20.35	20.40
	UL	28	30	28	29	30
	LL	11	8	5	10	10
Education	M	19.62	17.29	20.65	20.10	19.79
	UL	30	31	28	30	31
	LL	11	2	10	9	7
Family Living	M	18.48	15.73	20.23	18.76	18.24
	UL	26	28	29	27	31
	LL	11	4	2	12	4
Fine Arts and Communications	M	20.55	17.62	21.55	21.79	20.79
	UL	29	29	30	33	28
	LL	11	6	11	12	6
Humanities and Social Sciences	M	22.37	20.04	21.91	23.60	22.72
	UL	31	34	30	32	32
	LL	11	6	8	8	4
Nursing	M.	20.04	16.47	20.90	21.00	20.79
	UL	28	34	26	28	27
	LL	14	6	15	14	12
Physical and Engineering Sciences	M	25.47	27.73	23.27	25.00	25.73
	UL	30	34	26	31	31
	LL	22	20	18	18	17
Physical Education	M	18.06	17.00	18.24	18.12	17.41
	UL	25	28	24	27	27
	LL	12	6	12	7	7

Source: Dean of Students Office

Legend:
M = Mean
UL = Upper Limit
LL = Lower Limit



Note: This fugure should be read as follows: College of Business 1965 graduates achieved a mean composite ACT score of almost 2 points higher than all 1965 Brigham Young University graduates. College of Physical and Engineering Sciences 1965 graduates averaged approximately 2.5 points higher than College of Business graduates.

Source: Dean of Students Office

FIGURE 1

COMPARISON OF DIFFERENCE IN ACT MEAN SCORES BETWEEN BUSINESS GRADUATES OF 1965 AND ALL BRIGHAM YOUNG UNIVERSITY GRADUATES, PHYSICAL AND ENGINEERING SCIENCE, AND PHYSICAL ENGINEERING GRADUATES OF 1965 circumstances at Brigham Young University. Other data to supplement the ACT data are needed. Generally speaking, the ACT indices were more effective for predicting success at other universities than at Brigham Young University. As shown in Table VIII, ACT scores were less effective in the College of Business than in other colleges at the Brigham Young University. This was also true for high school grades.

Table IX shows the correlations of high school grades and ACT scores, with first semester college grade point average. Note that high school solid grade point average correlated most highly with the first semester college grade point average. Of the ACT scores the social science and natural science subtests showed the highest relationship with first semester college grade point average. The expectancy table, Table X, shows how achieved grades compared with predicted grades.[130]

Prediction of Success In Specific Courses in the College of Business

The following mean grades were achieved in high school courses by College of Business students: English, 2.68; mathematics, 2.59; social science, 2.83; natural science, 2.58; and overall high school grade point average, 2.67. College of Business students attained the following grades in university courses: Mathematics 105, 2.25; Economics 111, 2.12; English 111, 2.09; and overall university grade point average, 2.26.[131]

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[130] Winward and Owens, op. cit., p. 32.

[131] Ibid., p. 4.

TABLE VIII

COMPARISON OF CORRELATIONS BETWEEN HIGH SCHOOL GRADE, ACT SCORES AND COLLEGE GPA FOR COLLEGE OF BUSINESS AND OTHER COLLEGES OF THE BRIGHAM YOUNG UNIVERSITY FOR THE PERIOD 1961-1962

	Business	Bio. & Agri. Sci.	Education	Fam. Living	Fine Arts	General Col.	General Col.	Hum. & Soc. Sci.	Hum. & Soc. Sci.	Nursing	Phy. & Eng. Sci.	Physical Ed.
Variables						M	F	M	F			
H.S. Eng. GPA	.58	.56	.64	.60	.64	.41	.60	.55	.64	.56	.58	.50
H.S. Soc. St. GPA	.57	.58	.62	.55	.56	.44	.60	.50	.59	.55	.57	.61
H.S. Math GPA	.50	.47	.55	.61	.57	.29	.54	.42	.55	.53	.55	.36
H.S. Nat. Sci. GPA	.54	.56	.59	.47	.53	.39	.53	.49	.58	.54	.57	.43
H.S. Solid GPA	.63	.63	.67	.63	.65	.42	.62	.56	.68	.64	.63	.55
H.S. GPA	.45	.55	.60	.60	.77	.46		.61		.54	.60	.44
ACT Eng.	.28	.34	.55	.52	.51	.31	.50	.36	.47	.53	.40	.36
ACT Math	.32	.26	.39	.41	.28	.25	.45	.39	.39	.40	.44	.07
ACT Soc. St.	.39	.43	.64	.47	.47	.32	.48	.50	.47	.54	.37	.24
ACT Nat. Sci.	.38	.36	.52	.43	.38	.26	.45	.29	.44	.54	.30	.01
ACT Composite	.32	.42	.63	.56	.51	.33	.57	.45	.55	.63	.45	.15

Source: BYU Testing Office

TABLE IX

CORRELATIONS OF HIGH SCHOOL GRADES AND ACT SCORES WITH FIRST SEMESTER COLLEGE GPA FOR COLLEGE OF BUSINESS STUDENTS DURING THE PERIOD 1961-1962

Variables	2	3	4	5	6	7	8	9	10	11
1. H. S. Eng. GPA	.73	.72	.67	.92	.27	.32	.23	.27	.26	.58
2. H. S. Soc. St. GPA		.60	.68	.84	.20	.29	.28	.29	.31	.57
3. H. S. Math GPA			.65	.81	.26	.37	.21	.28	.28	.50
4. H. S. N.Sci. GPA				.81	.28	.25	.18	.30	.22	.54
5. H. S. Solid GPA					.30	.35	.28	.34	.32	.63
6. ACT English						.27	.36	.33	.30	.28
7. ACT Math							.57	.58	.60	.32
8. ACT Soc. Science								.76	.69	.39
9. ACT Nat. Science									.66	.38
10. ACT Composite										.32
11. College GPA										

Source: BYU Testing Office

TABLE X

EXPECTANCY TABLE COMPARING PERCENTAGE OF PREDICTED GRADES WITH ACHIEVED GRADES FOR THE PERIOD 1961-1962

Predicted GPA	N	ACHIEVED GRADES				
		0.00-1.74	1.75-1.99	2.00-2.49	2.50-3.49	3.50-4.00
3.50-4.00						
3.00-3.24	07					
2.75-2.99	28			21	68	43
2.50-2.74	20	05	05	30	60	11
2.25-2.49	34	15	06	38	41	
2.00-2.24	38	21	16	26	37	
1.75-1.99	45	38	18	33	11	
1.50-1.74	31	52	23	19	06	
0.00-1.49	24	75	17	08		

Source: BYU Testing Office

Table XI shows the percentage distribution of grades in each of the above-mentioned university courses plus the overall university grade point average for College of Business students.

TABLE XI

PERCENTAGE DISTRIBUTION OF GRADES IN SELECTED UNIVERSITY COURSES FOR COLLEGE OF BUSINESS STUDENTS FOR THE PERIOD 1965-1966

Grades Received	Math 105	Economics 111	English 111	Overall
A	13	5	4	2
B	24	29	25	30
C	41	43	53	52
D	18	18	14	14
E	4	5	4	2

Source: BYU Testing Office

Table XII shows the correlations of ACT scores and high school grades with specific university courses and with overall university grade point average for College of Business students.

The following intercorrelations of college grades were found:

	r	N
Mathematics vs Economics Grade	.463	138
Mathematics vs English	.307	146
Mathematics vs Overall GPA	.606	164
Statistics vs Economics	.471	32
Statistics vs English	.273	30
Statistics vs Overall GPA	.695	41
Economics vs English	.464	242
Economics vs Overall GPA	.800	283
English vs Overall GPA	.686	318

TABLE XII

CORRELATIONS WITH COLLEGE GRADES--COLLEGE OF BUSINESS STUDENTS

ACT Tests & High School Grades	College Math GPA		College Economics GPA		College English GPA		College Overall GPA	
	ACT	H.S. Grade	ACT	H.S. Grade	ACT	H.S. Grade	ACT	H.S. Grade
1. English	.157	.236	.292	.218	.448	.215	.306	.254
2. Mathematics	.383	.213	.327	.136	.278	.166	.372	.224
3. Social Studies	.141	.193	.440	.239	.358	.209	.430	.250
4. Natural Science	.206	.178	.413	.222	.285	.189	.363	.217
5. Composite & H.S. Ave.	.283	.293	.469	.281	.432	.272	.468	.325
Multiple Correlation* (Tests & Grades 1-4)	.385	.301	.484	.291	.488	.274	.479	.326
Standard Error of Estimate**	.936	.967	.826	.903	.697	.767	.632	.680
Number of Students	164	164	283	283	318	318	392	392

*Two separate multiple correlations are given. One is based on the four ACT tests, and the other one is based on the four high school grades.

**Standard error of estimate: A statistic used to describe the accuracy of prediction. If the standard error of estimate is .60, two-thirds of the students who are predicted to have obtained a 2.0 GPA should actually obtain GPA's between 1.40 and 2.60.

Source: BYU Testing Office

In commenting on the above findings pertaining to intercorrelations of college grades Winward and Owens concluded, "academic achievement in all of these courses requires general scholastic aptitude, although some much more than others." Also they suggested that success in the different courses in business was "only moderately related." Finally they said, "because there are no extremely high correlations between courses, there is a basis for assuming that achievement in each course has some unique elements."[132]

VII. SUMMARY

During the period of 1930 to 1960 there were over 800 different research studies performed on the topic of applicant selection and admission to the university.

The history of admission procedures has been one of increasing formalization and standardization. From a simple beginning of face-to-face oral examination, formal standardized testing and application procedures have evolved.

The two major factors considered in the research of predicting university success are intellectual and non-intellectual characteristics. Intellectual factors are those which deal with the academic process, while non-intellectual factors are those which deal with personality, motivation and attitude of individuals. The majority of research studies performed have dealt with intellectual criteria and predictors of success.

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[132] Ibid., pp. 29, 33.

Global and differential are the two major types of university admission-selection research studies. Global studies deal with overall criteria of academic excellence, while differential studies deal with specific criteria such as grades in particular courses. About 95 per cent of all research studies reported in the literature were of the global type.

There is general agreement that high school performance expressed as high school grade point average or rank in graduating class has the highest predictive value of any criteria used in predicting university success. There is some agreement that the college preparatory program with emphasis on such subjects as English, mathematics, science and foreign language is the best preparation for university success.

The most widely used types of tests for university admission and prediction of success are scholastic aptitude tests. The College Entrance Examination Board tests are the most widely used. The American College Tests (ACT), a recently developed test, is in use at the Brigham Young University. The ACT has moderately high predictive ability for predicting university success.

There was little data reported on the relationship of lower-division course preparation to general success in upper-division course work.

Generally, the junior college transfer student will not do as well at the university as he did at the junior college. He will not do as well as the native university student or the transfer student from other institutions of higher education. The junior college transfer student, however, is likely to recover academically.

There were few research studies reported on other factors such as repeating of courses, changing majors, and academic loads carried.

In the College of Business high school G.P.A., high school rank and scholastic aptitude tests show moderately high correlations with university G.P.A. for business students. There was conflicting evidence on the value of varipus predictors such as specific high school courses and scholastic aptitude test scores in predicting grades in specific business disciplines.

A review of the catalogs of selected colleges of business revealed two basic types of institutions: those which admitted lower-division students and those which did not. Of those colleges which admitted lower-division business students, the following high school units of study were required: English, 3 to 4; mathematics, 2 to 4; science, 1 to 2; foreign language, 1 to 2; and social science, 1 to 3. The only high school grade point average requirement designated by colleges of business were those stipulated for the university as a whole.

Most of the institutions which stated admission requirements to the upper-division business program required the following semester hours of university credit: economics, 6; mathematics, 3 to 6; English, 6; accounting, 6; and statistics, 3. Varying amounts of credit were required to enter the upper-division College of Business. There was general agreement that a "C" average should be attained upon completion of lower-division requirements.

There are several special plans for admission to the College of Business in operation at various universities.

The characteristics of university students in general, Brigham Young University students, and College of Business (BYU) students in particular were described.

CHAPTER III

THE RESEARCH DESIGN

The procedures used in this study are described in five sections as follows: (1) General Procedures, (2) Population, (3) Selection of the Sample, (4) Data Reviewed in this Study, and (5) Statistical Analysis.

I. GENERAL PROCEDURES

This study was conducted at Brigham Young University during the fall and spring semesters of the 1966-67 school year. Data were collected from the following sources: high school transcripts, university transcripts, American College Test records, "Semester Summary of Grade Point Averages" report, and a list of graduates by year.

Copies of high school and university transcripts were procurred from the Brigham Young University Records Office. Because high school transcripts were not available in the Records Office for transfer students, it was necessary to request these records from the high schools. There were 224 requests made for 324 high school transcripts. Ninety-two per cent of the high schools responded by forwarding 298 high school transcripts. Additional transcripts were received after the other records had been processed on the computer.

After these transcripts were obtained, pertinent data were recorded on coding sheets. IBM cards were punched from the coding sheets for computer processing on the computer. Input to the computer consisted of the following: (1) student data cards as described in the preceding paragraph, (2) instruction program (prepared by a computer programmer), and (3) statistical "canned" program cards. Output from the computer was in the form of listings giving required data and statistical analyses.

II. POPULATION

The population of this study was all College of Business students at Brigham Young University. Statistical tests of difference were applied to determine if in reality there are two or three distinct populations rather than only one. Rejection of Hypothesis One[1] would have indicated that in relation to grade point average, College of Business graduates form a separate population from other Brigham Young University graduates.

Rejection of Hypothesis Two would have indicated that College of Business graduates form a separate population from business students who were academically suspended. This statement applies also to hypotheses three, four, six and seven. Hypothesis five deals with transfer status, while hypothesis eight pertains to academic major department. Since some hypotheses contain more than one variable, it was anticipated that a hypothesis might be accepted in part and rejected in part.

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[1] *Supra* pp. 6 *et seq*.

III. SELECTION OF THE SAMPLE

Two groups of students were selected as the sample in this study. Group One consisted of all 1965 and 1966 graduates from the College of Business at Brigham Young University. Originally there were 648 students in this group. For various reasons 61 graduates were eliminated from this group leaving 587 students studied in Group One. Their names came from the College of Business Dean's list of graduates for Spring and Summer commencements in 1965 and 1966. A breakdown of the original group by semester in which they graduated follows:

	1965	1966	Grand Total
May	232	233	465
August	87	96	183
Total	319	329	648

Group Two included all students who were suspended for academic reasons during 1965 and 1966. Originally there were 254 students in this group. For various reasons 58 students were eliminated from this group leaving 196 students studied in Group Two. The names of the students in this Group came from the "Semester Summary of Grade Point Averages" Reports for 1965 and 1966. A breakdown of the original group by semester in which they were suspended follows:

	1965	1966	Grand Total
Fall	41	54	95
Spring	71	76	147
Summer	3	9	12
Total	115	139	254

IV. DATA REVIEWED IN THIS STUDY

Graduates and academically suspended students were compared on variables related to (1) lower-division collegiate preparation, (2) high school preparation and (3) general factors. Lower-division collegiate preparation included (1) grade point average, (2) grades in lower-division College of Business core courses, (3) year in which these courses were taken, (4) number of semester hours of transfer credit, (5) number of lower-division core courses repeated, and (6) American College Test scores.

High school preparation related to (1) grade point average, (2) rank in graduating class, (3) major course of study in high school, and (4) grades and number of high school semester units taken of mathematics, English, science, social science, and business. General factors included (1) major department, (2) transfer status, (3) class (for academically suspended students only), and (4) sex. A complete list of variables is included in Appendix B.

In the collection, compilation, and organization of data in this study, it was necessary to identify the courses that met College of Business lower-division core requirements. The courses which currently comprise these requirements are listed in Chapter I.[2] There were several factors, however, which tended to complicate this seemingly simple matter. Time, substitution, and change of departmental responsibility or course number were major contributing factors.

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[2] *Supra* pp. 11 *et seq*.

Table XIII identifies six lower-division college core requirements, but thirteen other courses existed which also met these requirements. There were changes in college core requirements as each new catalog was published. A review of the changes made during the period from 1960 to 1966-68 indicated some requirements remained quite stable, while others changed in subject matter emphasis.

V. STATISTICAL ANALYSIS

To answer the questions posed in Chapter I, frequency distributions with percentages and means were run on the computer. Hypotheses were then tested by means of the t-test for unmatched samples, chi square, and analysis of variance tests of difference. Table XIV indicates which statistical tests were used for each hypothesis developed in Chapter I.

Simple correlation ratios (r's) using the Pearson product moment correlation formula were run on the computer for 151 different combinations of variables. Significantly different variables which showed a high correlation with the criterion dependent variable of university grade point average were then considered for selection as admission requirements to the College of Business.

TABLE XIII

COLLEGE OF BUSINESS LOWER-DIVISION CORE REQUIREMENTS 1960-61 to 1966-68

Course	1960-61	1961-62	1962-64	1964-66	1966-68
Acct 101		G			
Acct 121		X			
Acct 131			X		
Acct 201	XX	XX	XX	XX	XX
Acct 202	A	A	XX	XX	XX
Acct 211	D	D	D		
Acct 212			E		
Econ 101	C	C	C	C	
Econ 111	X	X	X	XX	XX
Econ 112	X	X	X	X	X
Econ 274			A	A	A
Stat 131	X				
Stat 221	X	X	X	X	X
Stat 231	X				
Stat*		X			
Math 105				X	B
Math 108					X
Math 111			F	B	B
Math 112			F	B	B

Legend:

X - Basic lower-division College Core Requirement
XX - Only lower-division College Core Requirements required for Business Education majors
A - Count as credit for Business Education majors
B - Substitute for basic math requirement
C - Substitute for Econ 111 for Business Education majors
D - Substitute for Accounting 201
E - Substitute for Accounting 202
F - Substitute for Accounting 131
G - Substitute for Accounting 201 for Business Education majors

*Any number

TABLE XIV

STATISTICAL TESTS TO BE USED IN DATA ANALYSIS IN THIS STUDY

Hypothesis	Statistical Test
1.	t-test for unmatched samples
2.	t-test for unmatched samples
3a-d.	t-test for unmatched samples
3e.	Chi Square
4.	t-test for unmatched samples
5.	Chi Square
6.	t-test for unmatched samples
7.	t-test for unmatched samples
8.	t-test for unmatched samples
9.	Analysis of variance
10.	Analysis of variance

CHAPTER IV

FINDINGS

The findings of this study were divided into the following sections: (1) Academic Status (Graduated and Academically Suspended), (2) Transfer Status, (3) Major Department and Sex, (4) Relationships, and (5) Summary of Findings.

Within each section the following sub-factors (variables) were discussed: (1) lower-division preparation, (2) high school preparation, and (3) American College Test scores. Discussion of each sub-factor took the following form. First, the variable was described by frequency distributions, percentages, and mean scores. Second, the results of statistical tests of the significance of difference were presented. These tests included t-tests for unmatched data, chi square, and analysis of variance. Finally, the Pearson product moment correlation ratios (r) were stated to indicate degree of correlation for selected variables. Discussion and interpretation of data were included with each finding. These findings will answer questions and determine whether the hypotheses should be accepted or rejected.

I. ACADEMIC STATUS

The two major groups involved in this study were College of Business students who were either graduated or who were academically suspended from the university. This study sought to describe these two groups and to determine which variables were basically different.

Lower-Division Preparation

Question 1. What percentage of College of Business students go on to graduate and what percentage are academically suspended? Following is the number and percentage of graduates and academically suspended students involved in this study:

	Number	Percentage
Graduates	587	75
Academically Suspended*	196	25
	783	100

*This term will be abbreviated to Acad. Susp. in other tables and figures where space is limited.

During 1965 and 1966 the College of Business at Brigham Young University graduated 17 per cent of its average enrollment while 6 per cent of the students were suspended for academic reasons. These percentages are higher than those for the Brigham Young University as a whole. In 1966, 14 per cent of the undergraduate students enrolled at Brigham Young University received bachelor degrees while only 2 per cent were suspended from the university.[1] Both the college and university percentage of suspended students are well below the national average of 8 per cent as reported by Seibel.[2]

Question 2. In which year (Freshman, Sophomore, Junior, or Senior) are students classified when they are suspended for academic reasons? The number and percentage of academically suspended students categorized by class at the time they were suspended was as follows:

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[1] Academic Standards Office, Brigham Young University, April 20, 1967.

[2] Seibel, College and University, XLII, 52.

	Number	Percentage
Freshman	69	35
Sophomore	46	23
Junior	52	27
Senior	29	15
	196	100

As would be expected, there was a high percentage of academically suspended students classified as freshmen. Roberts in a study of over one thousand non-returning undergraduate students at the University of Missouri found that 38 per cent were freshmen. He also found that 33 per cent of the non-returnees were sophomores.[3] This is considerably higher than the 23 per cent who were suspended from the College of Business. One explanation why the percentage of juniors was higher than the percentage of sophomores is that junior college and other transfer students might come to Brigham Young University for their junior year. They might find then that they were not able to compete academically and would be suspended.

Question 3. What is the total mean university G.P.A. received by all Brigham Young University Seniors? What G.P.A. (total university and College of Business lower-division core) do College of Business graduates and academically suspended students receive? Brigham Young University Seniors during 1965 and 1966 achieved an average total university G.P.A. of 2.75.[4] Table XV shows the mean G.P.A.'s received by graduates and academically suspended students. This table points out a significant difference between graduates and academically suspended students on both total university and lower-division core G.P.A.

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[3] Roberts, Dissertation Abstracts, XXI, 1445.

The following reflects lower-division college core G.P.A.'s achieved by graduates and academically suspended students at Brigham Young University and at other institutions of higher education where credit has been transferred to Brigham Young University:

	B.Y.U. GPA	Transfer GPA	Total GPA
Graduates	2.51	2.59	2.55
Academically Suspended	1.25	2.28	1.46

A t-test was computed to determine if the difference between the transfer G.P.A.'s for graduates and academically suspended students was significant. As a result of this test a t-ratio of 2.758 was obtained. This is significant beyond the .01 level of probability. Although separate tests were not run, it is safe to assume that the difference in B.Y.U. G.P.A.'s between the two groups and the difference for academically suspended students between B.Y.U. G.P.A. and transfer G.P.A. were also significantly different beyond the .01 level of probability.

Grade distributions for lower-division core G.P.A. for graduates and academically suspended students are reflected in Table XVI.

A distribution above and below selected lower-division core G.P.A. cut-off points for graduates and academically suspended students is

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[4] Institutional Research Office, Brigham Young University. Telephone Interview with L. H. Campbell, Director, April 14, 1967.

TABLE XV

COMPARISON OF GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON TOTAL UNIVERSITY G.P.A. AND LOWER-DIVISION CORE G.P.A.

	N	Mean	d.f.	t-ratio	p
Total University G.P.A.					
Graduates	587	2.67	355	28.087	>.01
Acad. Susp.	196	1.50			
Lower-Division Core G.P.A.					
Graduates	587	2.55	228	19.027	>.01
Acad. Susp.	165	1.46			

TABLE XVI

LOWER-DIVISION CORE GPA DISTRIBUTION FOR GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS

	Graduates		Academically Suspended	
Grade	N	Percentage	N	Percentage
A	1	.2%	0	0.0%
A-	16	2.7	0	0.0
B+	38	6.5	0	0.0
B	69	11.8	4	2.4
B-	113	19.2	2	1.2
C+	121	20.6	10	6.1
C	141	24.0	27	16.4
C-	67	11.4	23	13.9
D+	21	3.6	30	18.2
D	0	0.0	26	15.8
D-	0	0.0	21	12.7
E	0	0.0	22	13.3
Total	587	100.0%	165	100.0%

pointed out in Table XVII. From this table it can readily be seen that 10 per cent of the academically suspended students received a 2.4 (C+) lower-division core G.P.A. or above while 61 per cent of the graduates achieved this well. Twenty-six per cent of the academically suspended students attained a 2.0 (C) G.P.A. or above while 85 per cent of the graduates were able to achieve at this level. The Business Fundamentals Division requires that students achieve a 2.25 G.P.A. in lower-division core courses before students are allowed to major in one of the academic departments. If this standard had been in effect during 1965 and 1966, about 31 per cent (181) of the students who graduated during these years would not have been able to meet it. About 11 per cent (22) of the students who were academically suspended during 1965 and 1966 attained a lower-division core G.P.A. of 2.25 or better. The fact that these suspended students did not take all of the core courses must also be considered.

Hypothesis 1. Students graduating from the College of Business do not achieve a cumulative grade point average (total university, or lower-division college core) which is significantly different from the G.P.A. which is achieved by all Seniors at the Brigham Young University.

Table XVIII shows the differences in mean G.P.A.'s for all Brigham Young University Seniors as compared with College of Business graduates. The difference between the mean G.P.A.'s of the two groups was significant, therefore, the null hypothesis was rejected. The alternate hypothesis, College of Business graduates receive a mean

TABLE XVII

COMPARISON OF GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON SELECTED LOWER-DIVISION CORE G.P.A. CUT-OFF POINTS

	Graduates		Acad. Susp.	
	N	%	N	%
2.4 and above	358	61%	16	10%
2.39 and below	229	39	149	90
2.25 and above	406	69	22	11
2.249 and below	181	31	143	89
2.0 and above	499	85	43	26
1.99 and below	88	15	122	74

TABLE XVIII

COMPARISON OF BRIGHAM YOUNG UNIVERSITY SENIORS WITH COLLEGE OF BUSINESS GRADUATES ON G.P.A.'S

	N	Mean	d.f.	t-ratio	P
Comparison 1					
B.Y.U. Seniors-- Total Univ. G.P.A.	3,617	2.75	573	7.193	>.01
Business Graduates Total Univ. G.P.A.	574	2.61			
Comparison 2					
B.Y.U. Seniors-- Total Univ. G.P.A.	3,617	2.75	573	16.012	>.01
Business Graduates Lower-division Core G.P.A.	574	2.55			

G.P.A. which is significantly lower than all Brigham Young University Seniors, was accepted at the .01 level of probability.

Question 4. What is the distribution of grades for College of Business students in each of the lower-division College of Business core courses (Economics 111 and 112, Accounting 201 and 202, Mathematics 101 and 105, and Statistics 221)? Mean G.P.A.'s were achieved as follows in the lower-division core courses:

	Econ 111	Econ 112	Acct 201	Acct 202	Math 105	Stat 221	Math 101
Graduates	2.65	2.57	2.76	2.58	2.41	2.39	2.51
Acad. Susp.	1.54	1.54	1.86	1.75	1.55	1.46	1.48

Academically suspended students encountered the greatest difficulty with statistics, mathematics, and economics. Graduates received the lowest G.P.A.'s in statistics, mathematics, and the second semesters of economics and accounting. Both groups received their highest grade averages in Accounting 201.

A detailed grade distribution for each of the lower-division core courses can be found in Table LV of Appendix A. This table reveals that none of the academically suspended students were able to achieve a grade of B+ or better in Economics 112 or Statistics 221. Graduates received D and E grades in each of the lower-division core courses with the exception of Statistics 221 where no graduate received a failing grade.

Table XIX indicates the number and percentage of students who took and who did not take each of the lower-division core courses. About nine out of ten students took Economics 111. Only about four out

TABLE XIX

LOWER-DIVISION CORE COURSES TAKEN BY COLLEGE OF BUSINESS STUDENTS

	Taken		Not Taken		Total	
	N	%	N	%	N	%
Economics 111	727	93	58	7	785	100
Economics 112	613	78	172	22	785	100
Accounting 201	700	89	85	11	785	100
Accounting 202	607	77	178	23	785	100
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Statistics 221	562	72	223	28	785	100
Mathematics 101	300	38	485	62	785	100

of ten students took Mathematics 101. Other courses which fewer stu- took were Mathematics 105 and Statistics 221.

It was interesting to see what percentage of graduates and what percentage of academically suspended students achieved above and below designated cut-off grades. The results of this analysis is shown in Table XX. Additional cut-off grade points at the 2.0 level were described for the mathematics and statistics courses because the 2.4 level was more difficult to attain in these courses. The generalization can be made that most graduates were able to attain a 2.4 grade in Economics 111 and 112, and in Accounting 201 and 202, while most academically suspended students were not able to do so. In Mathematics 105 and 101 and Statistics 221 most graduates were able to achieve a 2.0 grade while most academically suspended students were not able to achieve a grade this high.

Question 5. During which year are each of the lower-division College of Business core requirements taken by College of Business students? Table XXI shows the mean year in which each of the lower-division college core courses were taken. Generally, graduates tended to take college lower-division core courses later than academically suspended students. The only exception was in Statistics 221 where it was taken later by academically suspended students. Graduates tended to take courses according to the following schedule: Economics 111, Accounting 201, and Mathematics 105, first semester sophomore year; Economics 112 and Accounting 202, second semester sophomore year; Statistics 221, first semester junior year; and Mathematics 101, second

TABLE XX

COMPARISON OF GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON SELECTED LOWER-DIVISION CORE COURSE CUT-OFF GRADE POINTS*

	Graduates		Acad. Susp.	
	N	%	N	%
Economics 111				
2.4 and above	362	62	15	11
2.39 and below	223	38	127	89
	585	100	142	100
Economics 112				
2.4 and above	303	57	12	14
2.39 and below	227	43	74	86
	530	100	86	100
Accounting 201				
2.4 and above	385	66	36	31
2.39 and below	201	34	79	69
	586	100	115	100
Accounting 202				
2.4 and above	313	57	15	25
2.39 and below	236	43	46	75
	549	100	61	100
Mathematics 105				
2.4 and above	203	45	10	12
2.39 and below	244	55	76	88
	447	100	86	100
2.0 and above	354	79	34	40
1.99 and below	93	21	52	60
	447	100	86	100

TABLE XX (continued)

	Graduates		Acad. Susp.	
	N	%	N	%
Statistics 221				
2.4 and above	249	47	5	14
2.39 and below	280	53	32	86
	529	100	37	100
2.0 and above	411	78	14	38
1.99 and below	118	22	23	62
	529	100	37	100
Mathematics 101				
2.4 and above	115	50	12	15
2.39 and below	113	50	66	85
	228	100	78	100
2.0 and above	190	83	30	38
1.99 and below	38	17	48	62
	228	100	78	100

*NOTE: The lower-division core G.P.A. requirement for the Business Fundamentals Division is 2.25.

TABLE XXI

MEAN YEAR LOWER-DIVISION COLLEGE CORE COURSES TAKEN BY GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS

	Econ 111	Econ 112	Acct 201	Acct 202	Math 105	Stat 221	Math 101
Graduates	2.00	2.62	2.16	2.65	2.07	3.11	1.53
Acad. Susp.	1.55	1.92	1.89	2.18	1.71	3.14	1.39
Total Group	1.90	2.50	2.10	2.60	2.00	3.10	1.50

semester freshman year. Generally, academically suspended students tended to take the lower-division core courses one semester earlier than students who went on to graduate. A detailed breakdown showing how many students took each course during the years one through seven in their academic careers is shown in Table LVI of Appendix A.

Question 6. How many times are lower-division core courses repeated by College of Business graduates and by academically suspended business students? Graduates repeated lower-division core courses an average of 1.62 times while academically suspended students repeated these courses an average of 1.68 times. About 32 per cent (186) of the graduates and 40 per cent (78) of the suspended students repeated lower-division core courses.

Question 7. How many semester hours of collegiate credit are transferred from other institutions of higher education by College of Business graduates as contrasted with business students academically suspended by the University? Graduates transferred an average of 22.63 semester hours of credit from other institutions of higher education, whereas, academically suspended students transferred an average of 14.36 semester hours. One explanation for this finding is that graduates who were not able to pass a lower-division course at Brigham Young University took this course at some other college or university and then transferred this credit to Brigham Young University. This would account for the fact that academically suspended students had a slightly higher number of repeated courses and fewer credit hours transferred from other institutions.

Hypothesis 2. College of Business graduates do not differ significantly from business students who have been academically suspended with regard to the following factors of lower-division collegiate preparation:

a. mean grades received in the following lower-division college courses: Economics 111 and 112, Accounting 201 and 202, Mathematics 101 and 105, and Statistics 221

b. mean year in which each of the lower-division College of Business core requirements are taken

c. mean number of repeats of lower-divison core courses

d. mean number of semester hours of transfer credit.

The significant differences between graduates and academically suspended students in lower-division core grades are shown in Table XXII. All of the t-ratios are significant beyond the .01 level of probability. Thus, the null hypothesis, College of Business graduates do not differ significantly from business students who have been academically suspended with regard to mean grades in lower-division core courses, was rejected at the .01 level of probability.

Turning next to the second part of hypothesis 2, the question of year in which lower-division core courses were taken was considered. Table XXIII describes the results of t-tests computed to determine the significance of differences in years in which lower-division core courses were taken by graduates and academically suspended students. The null hypothesis, College of Business graduates do not differ significantly from business students who were academically suspended with respect to mean year in which lower-division core courses are taken, was rejected at the .01 level of probability with the exception that Statistics

TABLE XXII

COMPARISON OF GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON LOWER-DIVISION CORE GRADES

	N	Mean	d.f.	t-ratio	P
Grade Economics 111					
Graduates	585	2.65	208	15.421	>.01
Acad. Susp.	142	1.54			
Grade Economics 112					
Graduates	530	2.57	111	11.259	>.01
Acad. Susp.	86	1.54			
Grade Accounting 201					
Graduates	586	2.76	141	8.672	>.01
Acad. Susp.	115	1.86			
Grade Accounting 202					
Graduates	548	2.58	69	5.776	>.01
Acad. Susp.	61	1.75			
Grade Mathematics 105					
Graduates	447	2.41	114	7.828	>.01
Acad. Susp.	85	1.55			
Grade Statistics 221					
Graduates	528	2.39	41	6.619	>.01
Acad. Susp.	37	1.46			
Grade Mathematics 101					
Graduates	229	2.51	132	8.264	>.01
Acad. Susp.	78	1.48			

TABLE XXIII

COMPARISON OF GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON YEAR IN WHICH LOWER-DIVISION CORE COURSES WERE TAKEN

	N	Mean	d.f.	t-ratio	P
Economics 111					
Graduates	581	2.00	249	6.060	>.01
Acad. Susp.	142	1.55			
Economics 112					
Graduates	525	2.62	114	6.181	>.01
Acad. Susp.	85	1.92			
Accounting 201					
Graduates	583	2.16	158	3.308	>.01
Acad. Susp.	115	1.89			
Accounting 202					
Graduates	546	2.65	78	4.009	>.01
Acad. Susp.	61	2.18			
Mathematics 105					
Graduates	448	2.07	141	2.854	>.01
Acad. Susp.	86	1.71			
Statistics 221					
Graduates	526	3.11	40	.196	<.05
Acad. Susp.	36	3.14	Not Significant		
Mathematics 101					
Graduates	223	1.53	162	1.440	<.05
Acad. Susp.	77	1.39	Not Significant		

221 and Mathematics 101 were not included in this rejection. This portion of the hypothesis was accepted.

Next, the third part of hypothesis 2 which pertains to the number of times lower-division core courses were repeated was considered. The results of t-tests to determine the significance of difference between graduates and academically suspended students in mean number of times lower-division core courses were repeated is shown in Table XXIV. The t-ratio of .419 is not significant at the .05 level of probability. The null hypothesis which states that there is no significant difference between College of Business graduates and business students who were academically suspended with respect to number of times lower-division core courses were repeated is accepted at the .05 level of probability.

TABLE XXIV

COMPARISON OF GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON NUMBER OF TIMES LOWER-DIVISION CORE COURSES WERE REPEATED

	N	Mean	d.f.	t-ratio	P
Graduates	186	1.62	150	.419	$<.05$
Acad. Susp.	78	1.68	Not Significant		

Finally, the fourth part of hypothesis 2 which treats the mean number of semester hours of transfer credit was examined. T-tests were again computed to determine the significance between the two groups with regard to the number of semester hours of credit transferred to the Brigham Young University. The results of this test are shown in

Table XXV. The t-ratio 4.033 was significant beyond the .01 level of probability. The null hypothesis, that there is no significant difference between College of Business graduates and business students who were academically suspended with respect to the number of semester hours of credit transferred to the Brigham Young University, was rejected at the .01 level of probability.

TABLE XXV

COMPARISON OF GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON NUMBER OF SEMESTER HOURS OF CREDIT TRANSFERRED TO BRIGHAM YOUNG UNIVERSITY

	N	Mean	d.f.	t-ratio	P
Graduates	586	22.63	436	4.033	>.01
Acad. Susp.	196	14.36			

High School Preparation

The discussion of high school preparation will include the following areas: (1) mathematics, (2) English, (3) science, (4) social science, (5) business, and (6) other high school factors. Each of the above sections on academic disciplines will include a discussion on the number of semester units taken and grades received.

Question 1. What is the mean number of high school semester units of mathematics, English, science, social science, and business completed by College of Business majors? College of Business graduates completed the following number of semester units in high school subjects:

mathematics, 5.84; English, 7.33; science, 4.92; social science, 5.73; and business, 3.11. Business students academically suspended from the University completed the following number of semester units in high school subjects: mathematics, 4.95; English, 7.29; science, 4.23; social science, 6.05; and business, 3.80. Graduates completed more semester units in each of the above academic areas with the exception of social science and business.

Figure 2 shows the percentage of students who graduated and the percentage of students who were academically suspended according to the number of semesters of high school mathematics they had taken. Increasing the number of high school semesters increased the probability of graduating and decreased the probability of being academically suspended. Table LVII in Appendix A presents further detail on semester units of high school mathematics taken by graduates and academically suspended students.

A graphic picture of the high school mathematics courses taken by students who graduated and students who were academically suspended is presented in figure 3. As the high school mathematics courses became more advanced, (Algebra I through Solid Geometry are listed in order of complexity) a smaller percentage of both graduates and academically suspended students took them. In contrast, more of the students who took the advanced courses tended to graduate from the College of Business and fewer tended to be academically suspended. A smaller percentage of graduates and a larger percentage of academically suspended students took Business Mathematics and Applied/Shop Mathematics.

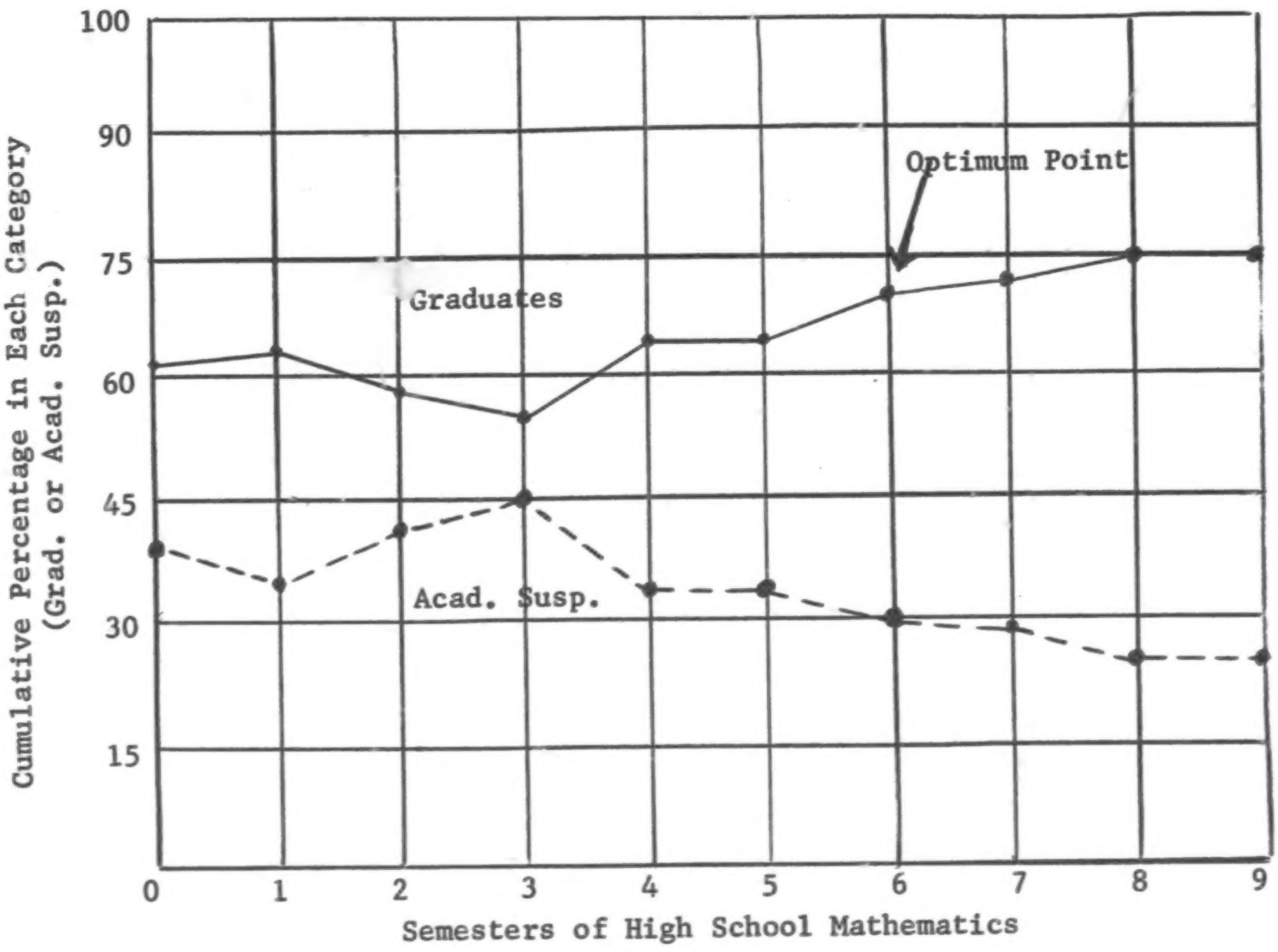

FIGURE 2

PERCENTAGE OF GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS BY SEMESTERS OF HIGH SCHOOL MATHEMATICS TAKEN

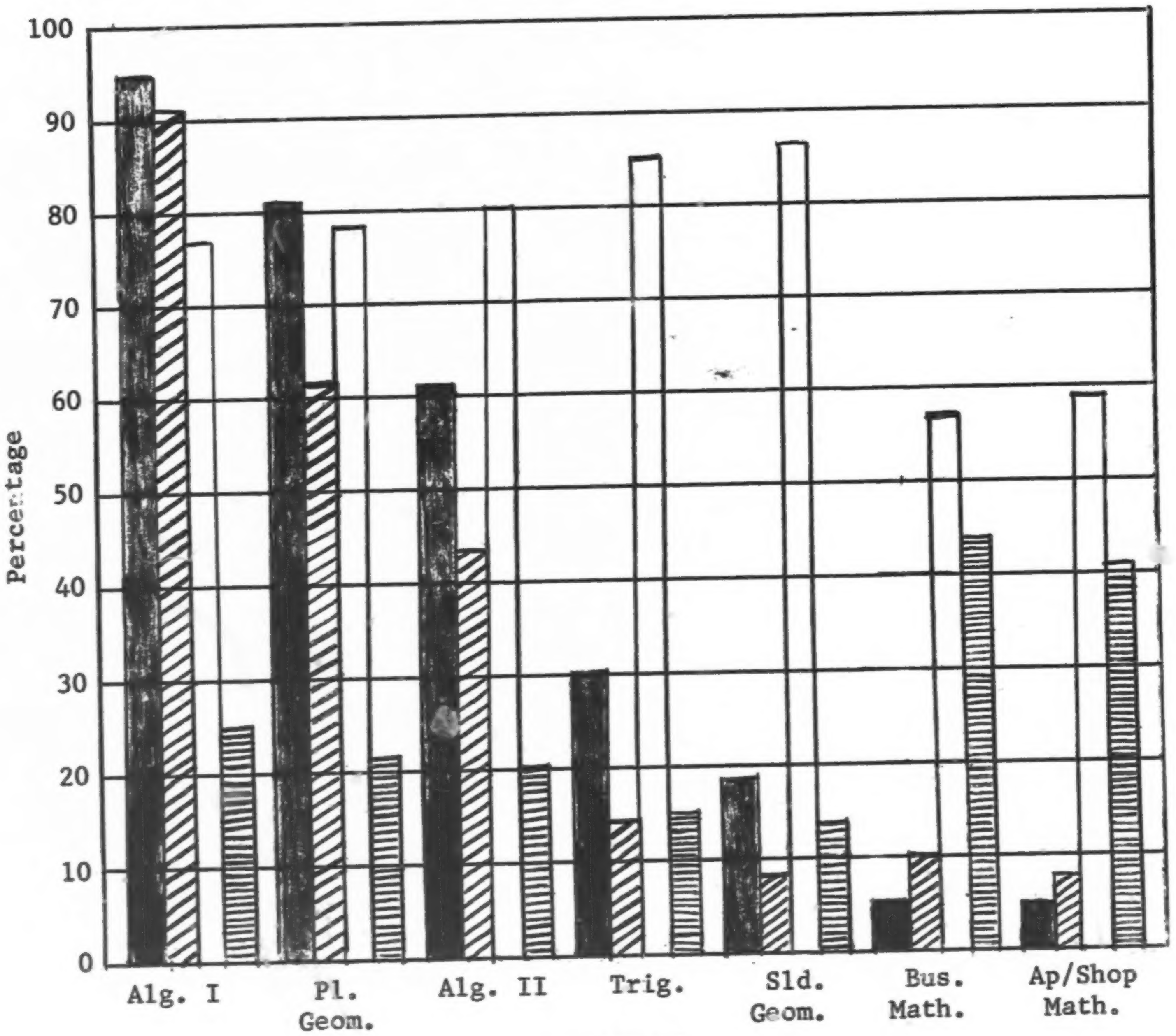

FIGURE 3

STUDENTS TAKING HIGH SCHOOL MATHEMATICS WHO GRADUATED AND WHO WERE ACADEMICALLY SUSPENDED

Percentage of Acad. Susp. who took course ▨

Percentage of Graduates who took course ■

Percentage of those who took course who graduated □

Percentage of those who took course who were Acad. Susp. ▥

Larger percentages of the students taking these courses were academically suspended.

Students graduated from the College of Business received the following mean grades in high school mathematics: Algebra I, 2.72; Algebra II, 2.52; Plane Geometry, 2.59; Trigonometry, 2.69; Solid Geometry, 2.52; with an overall mathematics grade of 2.68. Students academically suspended received mathematics grades as follows: Algebra I, 2.20; Algebra II, 1.98; Plane Geometry, 1.89; Trigonometry, 1.96; Solid Geometry, 1.94; and an overall mathematics grade of 2.07. Students graduated from the College of Business achieved consistently higher in high school mathematics than students who were academically suspended. Further detail on high school mathematics grades can be found in Table LVIII in Appendix A.

College of Business graduates attained a 2.73 mean G.P.A. in high school English while students academically suspended achieved a 2.16 G.P.A.

In the high school science academic area the subjects of Chemistry and Physics were examined in this study in addition to the overall science G.P.A. Table XXVI shows the G.P.A., number, and percentage of students taking these science courses. A higher percentage of College of Business graduates took high school chemistry and physics as compared with academically suspended students who took other science courses. Also, as would be expected the graduates achieved higher grades in these courses.

Next, the social science area was examined. United States History, World History, Civics, Economics, and overall social science

3

TABLE XXVI

COMPARISON OF GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON HIGH SCHOOL SCIENCE COURSES

	Mean G.P.A.	N	Percentage of each Group
Chemistry			
Graduates	2.48	422	72
Acad. Susp.	1.74	106	54
Total Group	2.32	528	67
Physics			
Graduates	2.54	299	51
Acad. Susp.	2.25	42	21
Total Group	2.50	341	43
Overall Science			
Graduates	2.61	580	99
Acad. Susp.	2.04	191	97
Total Group	2.47	771	98

grades are presented in Table XXVII. Even though graduates tended to take fewer semester hours in social science courses they achieved higher grade point averages than academically suspended students.

The percentage of students taking Economics in high school is a very interesting figure. The higher percentage of academically suspended students taking this course could indicate an increased percentage of high school students taking Economics since these students graduated from high school later than the group of College of Business graduates. This increase in enrollment is in line with the national trend for increased enrollments in high school economics courses as revealed by reports from the Joint Council on Economic Education.

Finally, the high school business area was studied. Table XXVIII shows grades and number and percentage of the students taking typewriting, shorthand, bookkeeping and general business. Grades in high school business were the highest average of any of the grades given in any academic area studied. Similar to the findings in the social science field, we find that more academically suspended students than graduates took business courses, but that the graduates received higher grades.

College of Business graduates achieved a mean high school G.P.A. of 2.70 and a mean stanine rank in their graduating class of 6.16. This means that for every nine students there would be about six students who achieved lower grades than the average graduate of the College of Business. Academically suspended students attained a mean high school G.P.A. of 2.15 and a mean stanine rank of 4.19. These findings are in

TABLE XXVII

COMPARISON OF GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON HIGH SCHOOL SOCIAL SCIENCE COURSES

	Mean G.P.A.	N	Percentage of each Group
U.S. History			
Graduates	2.77	559	95
Acad. Susp.	2.13	185	94
Total Group	2.62	744	95
World History			
Graduates	2.81	255	43
Acad. Susp.	2.14	100	51
Total Group	2.61	355	45
Civics			
Graduates	2.88	437	74
Acad. Susp.	2.28	154	78
Total Group	2.72	591	75
Economics			
Graduates	2.83	60	10
Acad. Susp.	2.42	26	13
Total Group	2.75	86	11
Overall Soc Sc GPA			
Graduates	2.89	585	100
Acad. Susp.	2.28	196	100
Total Group	2.71	781	100

TABLE XXVIII

COMPARISON OF GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON HIGH SCHOOL BUSINESS COURSES

	Mean G.P.A.	N	Percentage of each Group
Typewriting			
Graduates	2.80	473	81
Acad. Susp.	2.41	162	82
Total Group	2.71	635	81
Shorthand			
Graduates	3.21	71	12
Acad. Susp.	2.26	29	15
Total Group	2.95	100	13
Bookkeeping			
Graduates	3.14	143	24
Acad. Susp.	2.70	77	39
Total Group	3.00	220	28
General Business			
Graduates	3.01	68	12
Acad. Susp.	2.60	26	13
Total Group	2.93	94	12
Overall Bus. GPA			
Graduates	2.89	503	86
Acad. Susp.	2.53	172	88
Total Group	2.80	675	86

line with the reported research on high school G.P.A. and high school rank.

The distribution of students in the sample by high school major is shown in Table XXIX. About 57 per cent of the graduates majored in a high school college preparatory program while 36 per cent majored in business. There was a higher percentage of academically suspended students who majored in business than majored in a college preparatory program (48 per cent compared with 46 per cent).

Hypothesis 3. In considering the following aspects of high school preparation, College of Business graduates do not differ significantly from business students who have been academically suspended:

a. mean number of high school semester units of mathematics, English, science, social science, business completed

b. high school grade point average (mathematics, English, science, social science, business, and total)

c. mean grades in such specific high school subjects as algebra, geometry, and economics

d. mean stanine rank

e. high school major

Table XXX presents the results of t-tests to determine the differences between graduates and academically suspended students in the number of high school units of mathematics, English, science, social science, and business completed by each group. A difference which was not significant is indicated in the table. Differences which were significant were designated in the "p" column with the symbols $>.01$ or $>.05$ which means these differences were significant at or beyond the

TABLE XXIX

COMPARISON OF GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON HIGH SCHOOL MAJOR

Major	N	Percentage of each Group
College Preparatory		
Graduates	336	57
Acad. Susp.	90	46
Business		
Graduates	209	36
Acad. Susp.	94	48
Other		
Graduates	42	7
Acad. Susp.	12	6
Total		
Graduates	587	100
Acad. Susp.	196	100

TABLE XXX

COMPARISON OF SIGNIFICANT DIFFERENCES BETWEEN GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON NUMBER OF HIGH SCHOOL SEMESTER UNITS OF SELECTED SUBJECTS

	N	Mean	d.f.	t-ratio	P
Mathematics					
Graduates	576	5.84	310	5.128	$>.01$
Acad. Susp.	191	4.95			
English					
Graduates	576	7.33	294	.335	$<.05$
Acad. Susp.	191	7.29	Not Significant		
Science					
Graduates	576	4.92	340	4.241	$>.01$
Acad. Susp.	191	4.23			
Social Science					
Graduates	576	5.73	303	2.038	$>.05$
Acad. Susp.	191	6.05			
Business					
Graduates	576	3.11	302	3.025	$>.01$
Acad. Susp.	191	3.80			

.01 or .05 level of probability. Thus it can be seen that all differences were significant with the exception of the number of units of high school English completed. Also, it must be realized that the means for academically suspended students were higher than the means for graduates in the social science and business areas. The hypothesis which states that College of Business graduates do not differ significantly from business students who have been academically suspended in mean number of high school semester units of mathematics, English, science, social science, and business completed must be rejected with the exception of English. Graduates took more mathematics and science while academically suspended students took more social science and business.

Secondly, that part of hypothesis 3 dealing with high school grade point averages and mean grades in specific high school subjects was considered. The results of t-tests to determine these differences are reflected in Table XXXI. All of the above differences were significant with the exception of Solid Geometry. This difference may not have been significant because of the limited number of samples involved for academically suspended students. The null hypothesis that there is no significant difference between College of Business graduates and academically suspended students in high school grade point average (mathematics, English, science, social science, business and total) is rejected. Also, hypothesis 3c which is concerned with the differences between graduates and academically suspended students in specific high school subjects as listed in Table XXXI was rejected with the exception of Solid Geometry which did not have a significant difference.

TABLE XXXI

COMPARISON OF SIGNIFICANT DIFFERENCES BETWEEN GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON HIGH SCHOOL GRADES

	N	Mean	d.f.	t-ratio	P
Mathematics					
Algebra I					
Graduates	556	2.72	304	6.416	>.01
Acad. Susp.	179	2.20			
Algebra II					
Graduates	357	2.52	145	5.174	>.01
Acad. Susp.	87	1.98			
Plane Geometry					
Graduates	477	2.59	228	8.554	>.01
Acad. Susp.	124	1.89			
Trigonometry					
Graduates	175	2.69	35	3.258	>.01
Acad. Susp.	28	1.96			
Solid Geometry					
Graduates	107	2.52	18	1.813	<.05
Acad. Susp.	16	1.94	Not Significant		
Overall Math GPA					
Graduates	576	2.68	377	9.988	>.01
Acad. Susp.	191	2.07			
English					
Graduates	576	2.73	386	10.047	>.01
Acad. Susp.	191	2.16			
Science					
Graduates	576	2.61	386	9.303	>.01
Acad. Susp.	191	2.04			

TABLE XXXI (continued)

	N	Mean	d.f.	t-ratio	P
Social Science					
Economics					
Graduates	60	2.83	60	2.154	>.05
Acad. Susp.	26	2.42			
Overall Soc Sc GPA					
Graduates	576	2.89	367	10.625	>.01
Acad. Susp.	191	2.28			
Business					
Typewriting					
Graduates	472	2.80	285	5.121	>.01
Acad. Susp.	160	2.41			
Bookkeeping					
Graduates	143	3.14	147	3.639	>.01
Acad. Susp.	77	2.70			
Overall Bus. GPA					
Graduates	503	2.89	308	5.041	>.01
Acad. Susp.	171	2.53			
Overall High School GPA					
Graduates	584	2.70	488	12.560	>.01
Acad. Susp.	196	2.15			

Next, the fourth part of hypothesis 3 was tested to determine if there was a significant difference between graduates and academically suspended students in mean high school stanine rank. The results of this t-test are shown in Table XXXII. The hypothesis that there is no significant difference between College of Business graduates and academically suspended students on mean high school stanine rank is rejected at the .01 level of significance.

TABLE XXXII

COMPARISON OF SIGNIFICANT DIFFERENCE BETWEEN GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON HIGH SCHOOL STANINE RANK

	N	Mean	d.f.	t-ratio	P
Graduates	329	6.16	156	7.945	.01
Acad. Susp.	92	4.19			

Finally, the fifth part of hypothesis 3 was tested to determine if the difference between actual number of students majoring in each high school major and the expected number was significant. The Chi Square test was used to determine the significance of these differences. The numbers of graduates and academically suspended students who majored in each high school major may be found in Table XXIX. A Chi Square of 9.4847 was found. This is significant beyond the .01 level of probability; therefore, the hypothesis that there is no significant difference between College of Business graduates and academically suspended students in high school major is rejected at the .01 level of probability.

American College Test Results

The last category of differences between graduates and academically suspended students studied in addition to lower-division collegiate preparation and high school preparation was American College Test results. There were 155 graduates of the College of Business who took the ACT (26 per cent). About 55 per cent (108) of the academically suspended students took the ACT. The reason a larger percentage of suspended students took the ACT is that they entered the Brigham Young University at a later date than the graduates. Each year more entering students have been required to take the ACT.

Question 1. What mean American College Test (ACT) scores (composite, mathematics, English, social science, and natural science) do College of Business majors achieve? College of Business graduates achieve the following mean scores on the ACT: Composite, 20.98; Mathematics, 21.03; English, 20.01; Social Science, 21.12; and Natural Science, 21.25. Academically suspended students scored as follows: Composite, 17.42; Mathematics, 17.09; English, 16.36; Social Science 17.42; and Natural Science, 18.40. Table LIX in Appendix A shows further details on the distribution of individual scores. The cumulative percentage from high to low was calculated for both graduates and academically suspended students and is recorded on Table LIX. Table XXXIII shows percentage of graduates and academically suspended students who would be included if the cut-off scores of 19, 20, and 21 were used on each component and composite score of the ACT. It can readily be

TABLE XXXIII

COMPARISON OF GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON SELECTED ACT STANDARD SCORES

	Scores of Graduates			Scores of Acad. Susp.		
	19	20	21	19	20	21
Composite	72%	64%	54%	46%	37%	30%
Mathematics	66	61	49	42	36	32
English	64	55	48	37	29	21
Social Science	72	62	54	46	39	31
Natural Science	71%	64%	60%	57%	52%	42%

seen from this table that 72 per cent of the graduates and 46 per cent of the academically suspended students achieved a composite score of 19 or above.

Hypothesis 4. College of Business graduates do not differ significantly from business students who have been academically suspended with regard to mean ACT scores (composite, mathematics, English, social science, or natural science). The differences between mean ACT scores for graduates and academically suspended students were tested and the results are shown in Table XXXIV. All differences were significant as shown in Table XXXIV beyond the .01 level of probability. The hypothesis that College of Business graduates do not differ significantly from business students who have been academically suspended with regard to mean ACT scores is rejected at the .01 level of significance.

II. TRANSFER STATUS

In addition to academic status, transfer status was a second major factor in this study. Transfer students come from junior colleges, four-year colleges, universities, and a combination of the three.

Lower-Division Preparation

Question 1. What percentage of the students who graduated or were academically suspended transferred from other colleges and universities? What percentage completed all of their academic work at Brigham Young University? About 55 per cent of the graduates were nontransfer students while 45 per cent were transfer students. About 63

TABLE XXXIV

COMPARISON OF SIGNIFICANT DIFFERENCES BETWEEN GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS ON ACT SCORES

	N	Mean	d.f.	t-ratio	P
ACT Composite					
Graduates	152	20.98	207	6.173	>.01
Acad. Susp.	104	17.42			
ACT Mathematics					
Graduates	154	21.03	230	5.165	>.01
Acad. Susp.	108	17.09			
ACT English					
Graduates	155	20.01	214	6.683	>.01
Acad. Susp.	108	16.36			
ACT Social Science					
Graduates	154	21.12	225	5.258	>.01
Acad. Susp.	108	17.42			
ACT Natural Science					
Graduates	153	21.25	224	3.841	>.01
Acad. Susp.	105	18.40			

per cent of the academically suspended students were non-transfer students while 37 per cent were transfer students. Table XXXV presents more detail on transfer status. In comparing the percentages of graduates with the percentages of academically suspended students for each transfer institution it is evident that a larger percentage of students graduated who were transfer students from a university or combination of other institutions. Also, there was a smaller percentage of graduates than academically suspended students who had transferred from junior colleges. Eighty per cent of the total group were either native (non-transfer) or junior college transfer students. Only 20 per cent of the total group transferred from other institutions.

Question 2. What effect does being a transfer student in business have on a student's grade point average (total university and College of Business lower-division core)? All transfer students included in this study received an average total university G.P.A. of 2.43. Subdivided by type of transfer institution total university G.P.A.'s were received as follows: junior college, 2.37; college, 2.46; university, 2.60; junior college and college, 2.38; junior college and university, 2.07; college and university, 2.54; and junior college, college and university, 2.50.

Lower-division college core G.P.A. was divided in three classifications: (1) B.Y.U., (2) Transfer, and (3) Total. B.Y.U. lower-division college core G.P.A. was the average of all lower-division core courses taken at B.Y.U. Likewise, transfer lower-division core G.P.A. was the average of those lower-division courses taken at another

TABLE XXXV

COMPARISON OF TRANSFER STATUS BY GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS

	Graduates		Acad. Susp.		Total Group	
	N	%	N	%	N	%
Non-Transfer	321	55	123	63	444	57
Junior College Tr.	129	22	50	26	179	23
College Transfer	38	6	11	6	49	6
University Transfer	62	11	5	3	67	9
Comb. of Other Three Transfer Institutions	37	6	7	2	44	5
Totals	587	100	196	100	783	100

institution and transferred to Brigham Young University. Total lower-division core G.P.A. was the average of latest grade received in lower-division core courses, either taken at Brigham Young University or at a transfer institution. The three types of lower-division core G.P.A.'s classified by transfer institutions are found in Table XXXVI. From this table it can be seen that transfer students received substantially higher grades while attending other institutions than they did at Brigham Young University. The only exceptions were for the group of students who had transferred from a university and for the group who had transfer credit from both junior colleges and colleges. Both of these groups received higher grades in lower-division core courses at Brigham Young University than they did at their transfer institution. Also it can be observed that Brigham Young University students received lower average grades than transfer students.

Question 3. What effect does transfer status have on a student's grades in the lower-division core courses? With some exceptions grades in lower-division core courses were generally lower for native students than for students who took the same courses at another institution. This is clearly evident from the data which are presented in Table XXXVII. This table shows grades in lower-division core courses categorized by type of transfer institution. Generally students received the highest grades in the accounting courses and the lowest grades in the mathematics courses.

TABLE XXXVI

LOWER-DIVISION CORE GPA BY TRANSFER STATUS

	B.Y.U. GPA	Transfer GPA	Total GPA
Native	2.22	*	2.22
All Transfers	2.26	2.54	2.42
Junior College	2.09	2.55	2.32
College	2.38	2.53	2.41
University	2.51	2.46	2.54
Comb. J.C. and College	2.24	2.18	2.29
Comb. J.C. and Univ.	2.26	2.60	2.48
Comb. College & Univ.	2.53	2.99	2.81
Comb. all of above	2.52	3.38	3.10

*Not applicable

TABLE XXXVII

LOWER-DIVISION CORE GRADES BY TRANSFER STATUS

	Econ 111	Econ 112	Acct 201	Acct 202	Math 105	Stat 221	Math 101
Native	2.39	2.41	2.61	2.48	2.16	2.33	2.12
Junior College	2.47	2.45	2.60	2.57	2.34	2.20	2.41
College	2.49	2.41	2.67	2.42	2.26	2.30	2.16
University	2.65	2.62	2.69	2.61	2.47	2.41	2.48
J.C. and College	2.31	2.11	2.58	2.13	1.97	2.52	1.58
J.C. and University	2.52	2.45	2.64	2.46	2.61	2.33	2.61
College and Univ.	2.81	2.70	3.44	2.89	2.32	2.51	1.78
Comb. all above transfer institutions	3.70	3.40	3.00	2.90	3.01	2.70	2.00

Question 4. What effect does transfer status have on the year in which lower-division core courses are taken? In Table XXXVIII the average year lower-division core courses are taken is listed by type of transfer institution. The other combinations of transfer institutions were not listed because the small sample number caused wide variances.

TABLE XXXVIII

YEAR IN WHICH LOWER-DIVISION CORE COURSES ARE TAKEN BY TRANSFER STATUS

	Econ 111	Econ 112	Acct 201	Acct 202	Math 105	Stat 221	Math 101
Native	1.82	2.46	2.07	2.66	1.86	3.00	1.44
Junior College	1.99	2.51	2.12	2.43	2.23	3.22	1.55
Colleges	2.04	2.93	2.16	2.81	2.10	3.40	1.57
Universities	1.97	2.52	2.25	2.71	1.86	3.05	1.41

Generally it can be seen from this table that native students took lower-division core courses earlier than transfer students. Mathematics 101 was generally taken during the freshman year while Statistics 221 was delayed until the junior year. Economics 111 and Mathematics 105 were taken late during the freshman year or early in the sophomore year. Accounting was generally taken during the sophomore year. The general effect of taking a lower-division course at another institution was delay in taking the course in comparison to the average year the course was taken at Brigham Young University.

Question 5. What effect does transfer status have on the number of times lower-division core courses are repeated? Transfer students repeated lower-division core courses an average of .563 times whereas non-transfer students repeated them .545 times. Using the t-test this difference was found not to be statistically significant.

Hypothesis 5a. In comparing College of Business graduates with business students who have been academically suspended, there is no significant difference in transfer status. In other words as many transfer students would be expected to be graduated as native students in proportion to their relative numbers.

The Chi Square statistical test was used to test this hypothesis. A Chi Square of 15.6316 which is significant beyond the .01 level of probability was found. Therefore, the hypothesis stated above was rejected. The alternate hypothesis which states that there is a significant difference in transfer status between graduates of the College of Business and business students who were academically suspended would be accepted.

Hypothesis 6. There are no significant differences between transfer and non-transfer College of Business graduates and students academically suspended with regard to G.P.A. (total university, or lower-division core G.P.A.).

To test the significance of the differences as stated in this hypothesis the two-way analysis of variance statistical test was used. An F ratio of 32.655 which is significant beyond the .01 level was obtained for total university G.P.A. An F ratio of 26.323 which is significant beyond the .01 level was obtained for lower-division core

G.P.A. On the basis of these test results the null hypothesis was rejected at the .01 level of confidence. There are statistically significant differences in mean total university and lower-division core G.P.A. among transfer and non-transfer graduates and academically suspended students.

Hypothesis 7. For transfer students only between graduates and academically suspended students there is no significant difference in the grades received at other colleges or universities for lower-division college core courses.

The t-test was used to test the significance of the difference as stated in this hypothesis. A t-ratio of not over 1.806 which was not significant at the .05 level of probability was obtained. The hypothesis that for transfer students only, there is no significant difference in the grades received at other colleges or universities in lower-division core courses for College of Business graduates as compared with academically suspended students is accepted.

Hypothesis 8a. There is no significant difference between transfer and non-transfer students in lower-division college core G.P.A. Both total and B.Y.U. lower-division core G.P.A. were tested for this hypothesis.

The results are presented in Table XXXIX. The t-ratio for total lower-division core G.P.A. was significant beyond the .01 level of probability; therefore, the hypothesis was rejected. The t-ratio for the B.Y.U. lower-division core G.P.A. was not significantly

TABLE XXXIX

COMPARISON OF SIGNIFICANT DIFFERENCES BETWEEN
TRANSFER AND NON-TRANSFER STUDENTS ON
LOWER-DIVISION CORE GPA

	N	Mean	d.f.	t-ratio	P
Total lower-div. core GPA					
Transfer	334	2.42	751	3.254	$>.01$
Non-Transfer	419	2.22			
B.Y.U. lower-div. core GPA					
Transfer	315	2.26	687	.589	$<.05$
Non-Transfer	418	2.22	Not Significant		

different for the two groups. Because the B.Y.U. lower-division core G.P.A. is part of the total lower-division core G.P.A.; the whole hypothesis would not fail to be rejected on the basis of the non-significance of the difference in the B.Y.U. G.P.A.

High School Preparation

Question 1. What differences are there between transfer and non-transfer students in number of high school semester units of mathematics, English, science, social science, and business completed? The answer to this question can be found in Table XL. The differences between transfer and non-transfer students in the number of high school semester units of mathematics, English, and science taken were not significant. The non-transfer students did take a significantly larger number of social science and business courses.

TABLE XL

COMPARISON OF SIGNIFICANT DIFFERENCES BETWEEN TRANSFER AND NON-TRANSFER STUDENTS ON NUMBER OF HIGH SCHOOL SEMESTER UNITS OF SELECTED COURSES

	N	Mean	d.f.	t-ratio	P
Mathematics					
Transfer	336	5.62	736	.026	<.05
Non-Transfer	441	5.63	Not Significant		
English					
Transfer	336	7.26	701	1.492	<.05
Non-Transfer	441	7.40	Not Significant		
Science					
Transfer	336	4.73	744	.152	<.05
Non-Transfer	441	4.71	Not Significant		
Social Science					
Transfer	336	5.67	703	1.993	>.05
Non-Transfer	441	5.93			
Business					
Transfer	336	2.80	738	4.380	>.01
Non-Transfer	441	3.62			

Question 2. What are the differences in high school mathematics, English, social science, and overall high school grade point averages of transfer as compared with non-transfer business students? Table XLI gives an answer to this question. The interesting finding revealed in this table is that non-transfer students received significantly higher grade point averages in all areas studied.

Question 3. What is the difference between transfer and non-transfer students in high school stanine rank? Table XLII reveals that non-transfer students rank significantly higher than transfer students in their high school graduating class.

Hypothesis 8b. There is no significant difference between transfer and non-transfer students in high school preparation.

This hypothesis was tested by means of the t-test; the results of which are shown in Tables XL through XLII which are preceding. All differences were significant with the exception of the number of high school semester units of mathematics, English, and science completed. Therefore, the hypothesis was rejected with the exceptions noted. The alternate hypothesis that there is a significant difference between transfer and non-transfer students in high school preparation must be accepted with the exception that there is no difference in number of high school semester units of mathematics, English, and science taken.

American College Test Results

The last area of transfer status studied were the American College Test results.

TABLE XLI

COMPARISON OF SIGNIFICANT DIFFERENCES BETWEEN TRANSFER AND NON-TRANSFER STUDENTS ON GRADES IN SELECTED HIGH SCHOOL COURSES

	N	Mean	d.f.	t-ratio	P
Mathematics					
Transfer	336	2.46	726	2.182	$>.05$
Non-Transfer	441	2.59			
English					
Transfer	336	2.46	735	4.010	$>.01$
Non-Transfer	441	2.68			
Social Science					
Transfer	336	2.64	733	2.935	$>.01$
Non-Transfer	441	2.80			
Overall High School GPA					
Transfer	336	2.49	743	2.698	$>.01$
Non-Transfer	441	2.62			

TABLE XLII

COMPARISON OF SIGNIFICANT DIFFERENCE BETWEEN TRANSFER AND NON-TRANSFER STUDENTS ON HIGH SCHOOL STANINE RANK

	N	Mean	d.f.	t-ratio	P
Transfer	185	5.20	382	4.218	$>.01$
Non-Transfer	234	6.15			

Question 1. What mean composite ACT scores do transfer and non-transfer students achieve? Transfer students achieve a mean composite ACT score of 20.267 while non-transfer students attain a score of 19.443.

Hypothesis 8c. There are no significant differences between transfer and non-transfer students in mean composite ACT scores.

On the basis of the t-test results shown in Table XLIII this hypothesis must be accepted.

TABLE XLIII

COMPARISON OF DIFFERENCE BETWEEN TRANSFER AND NON-TRANSFER STUDENTS ON COMPOSITE ACT SCORE

	N	Mean	d.f.	t-ratio	P
Transfer	45	20.267	68	1.090	$<.05$
Non-Transfer	210	19.443	Not Significant		

III. SEX AND MAJOR DEPARTMENT

In addition to Academic Status and Transfer Status, Sex and Major Department were the last major factors studied. As will be pointed out, most females major in the Business Education Department, and most males major in the other three departments.

Question 1. What percentage of students who graduate or are academically suspended are males and what percentage are females? A breakdown of number and percentage of males and females by graduates and academically suspended students is shown in Table XLIV. While only 15 per cent of the total group are female, 20 per cent of the academically suspended students are female.

Hypothesis 5c. In comparing College of Business graduates with business students who have been academically suspended, there is no significant difference in the number of each sex.

To test this hypothesis a Chi Square statistical test was used. The resultant Chi Square was 5.2023 which is significant at the .05 level of probability. The hypothesis must be rejected. This finding does not appear to be in harmony with the literature which reports that females generally received significantly higher grades than males. Other factors which have not been isolated are probably involved.

Question 2. What percentage of those students who graduate and those who are academically suspended major in each of the academic departments in the College of Business? Table XLV compares the number and percentage of graduates and students academically suspended from

TABLE XLIV

COMPARISON BY SEX OF THE NUMBER AND PERCENTAGE OF GRADUATES AND STUDENTS ACADEMICALLY SUSPENDED

	Number	Percentage
Graduates		
Male	507	86
Female	80	14
Total	587	100
Acad. Susp.		
Male	156	80
Female	40	20
Total	196	100
Total Group		
Male	663	85
Female	120	15
Total	783	100

TABLE XLV

COMPARISON BY ACADEMIC DEPARTMENT OF THE NUMBER AND PERCENTAGE OF GRADUATES AND STUDENTS ACADEMICALLY SUSPENDED

	Accounting	Business Education	Business Management	Economics	Other	Total
Graduates						
Number	241	73	248	21	4	587
Percentage	41	12	42	4	a	100
Acad. Susp.						
Number	62	42	87	4	1	196
Percentage	32	21	44	3	a	100
Total Group						
Number	303	115	335	25	5	783
Percentage	38	15	43	3	a	100

a = less than 1 per cent

each academic department in the College of Business. While 38 per cent of the total group majored in the Accounting Department, only 32 per cent of the students who were academically suspended majored in Accounting. In contrast in the Business Education Department, only 15 per cent of the total group majored in Business Education while 21 per cent were academically suspended. Notice how closely these figures for Business Education compare with the figures for females presented in Table XLIV.

Hypothesis 5b. In comparing College of Business graduates with business students who have been academically suspended, there is no significant difference in major academic department.

This hypothesis was tested by means of Chi Square. A Chi Square of 12.7345 which is significant beyond the .01 level was obtained. Thus the null hypothesis was rejected. The alternate hypothesis that there is a significant difference in major academic department between graduates and business students who were academically suspended was accepted.

Lower-Division Preparation

Question 3. What G.P.A. (total university and lower-division core G.P.A.) are earned by students majoring in each of the academic departments? Table XLVI has the answer to this question. Accounting students earn better grades in the lower-division core courses than in other university courses. Business Education and Business Management majors tend to do better in their other university courses than in their

TABLE XLVI

COMPARISON OF MEAN GRADE POINT AVERAGE EARNED BY GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS IN EACH ACADEMIC DEPARTMENT

	Accounting	Business Education	Business Management	Economics
Total University GPA				
Graduates	2.72	2.71	2.49	2.67
Acad. Susp.	1.58	1.44	1.45	1.90
Lower-division Core GPA				
Graduates	2.77	2.38	2.35	2.67
Acad. Susp.	1.60	1.39	1.34	2.00

lower-division core courses. Economics majors do equally well in both areas. Another key point is the low G.P.A. Business Education majors received in lower-division core courses in relationship to the high G.P.A. they received in other university courses. There is also a wide variance between the total university and lower-division core G.P.A. for Business Management majors although not as pronounced as that for Business Education majors.

Hypothesis 9. There are no significant differences among the College of Business academic major departments in G.P.A. (total university, or lower-division core G.P.A.).

This hypothesis was tested by means of the two-way analysis of variance statistical test. An F-ratio of 3.942 was obtained for the variance in total university G.P.A. among departments. This indicates differences which are significant beyond the .01 level of probability. The interaction variance of 2.533 was not statistically significant. An F-ratio of 9.34 was obtained for the variance in lower-division core G.P.A. among departments. This was significant beyond the .01 level of probability. The interaction variance (1.944) for lower-division core G.P.A. differences was statistically significant. On the basis of these test results the null hypothesis was rejected at the .01 level of confidence. There are statistically significant differences among College of Business departments in the mean total university and lower-division core G.P.A.'s attained.

High School Preparation

Question 4. What is the mean number of semesters of high school mathematics taken by students in each of the academic departments? The mean number of high school semesters of mathematics taken by students in each department are as follows: Accounting, 6.00; Business Education, 3.95; Business Management, 5.76; and Economics, 6.36. Further detail on this is presented in Table LX in Appendix A.

Question 5. What is the mean grade point average received in high school mathematics for each academic major department? Following are the grade point averages in high school mathematics by major department: Accounting, 2.70; Business Education, 2.58; Business Management, 2.35; and Economics, 2.56. Tabulating these figures by graduate and academically suspended categories, the following grade point averages in high school mathematics were obtained:

	Accounting	Business Education	Business Management	Economics
Graduates	2.81	2.92	2.49	2.57
Acad. Susp.	2.28	1.98	1.98	2.50

It is interesting to note that while Business Education majors took less mathematics and achieved a lower grade point average in mathematics than Accounting majors, the graduates in Business Education achieved the highest mathematics G.P.A. Business Management majors rank in last position in mathematics grades.

Question 6. What G.P.A. do the students in each of the major departments receive in Algebra I, Algebra II, Plane Geometry, Trigonometry, and Solid Geometry? Table XLVII presents the answer to this question. Again, it can be seen that Business Education graduates outperform other graduates in all high school mathematics courses studied except Plane Geometry. Business Management majors ranked low in all mathematics courses.

Hypothesis 10. There are no significant differences among the College of Business academic major departments in number of high school units of mathematics taken, grades in high school mathematics courses, and grade average in high school mathematics.

This hypothesis was tested by means of several t-tests. Table XLVIII presents the results of t-tests to determine the significance of differences among the major academic departments in number of high school semester units of mathematics taken by graduates and academically suspended students. Table XLVIII indicates that the number of high school semesters of mathematics is a significant factor in Accounting and Business Management. There are not enough cases in economics to know for certain whether or not the difference is really significant. There was no significant difference between the two groups in the Business Education Department. The hypothesis would be rejected for Accounting and Business Management and accepted for Business Education and Economics.

In Table XLIX the results of t-tests to determine the significance of differences among the major academic departments in high school mathematics G.P.A. and among grades in specific high school courses are presented. The null hypothesis that there are no significant differences

TABLE XLVII

COMPARISON BY ACADEMIC DEPARTMENT OF HIGH SCHOOL MATHEMATICS GRADES

	Accounting	Business Education	Business Management	Economics
Algebra I				
Graduates	2.84	3.03	2.53	2.62
Acad. Susp.	2.53	2.06	1.98	3.00
Algebra II				
Graduates	2.70	3.00	2.34	2.37
Acad. Susp.	2.09	2.33	1.80	1.75
Plane Geometry				
Graduates	2.82	2.74	2.32	2.57
Acad. Susp.	2.05	1.82	1.75	3.50
Trigonometry				
Graduates	2.81	3.00	2.61	2.40
Acad. Susp.	1.70	2.50	2.00	2.50
Solid Geometry				
Graduates	2.56	*	2.49	2.43
Acad. Susp.	2.11	*	1.00	2.50

*Not available

TABLE XLVIII

COMPARISON OF SIGNIFICANT DIFFERENCES AMONG MAJOR DEPARTMENTS IN NUMBER OF HIGH SCHOOL SEMESTER UNITS OF MATHEMATICS BY GRADUATES AND ACADEMICALLY SUSPENDED CLASSIFICATIONS

	N	Mean	d.f.	t-ratio	P
Accounting					
Graduates	238	6.17	89	2.851	>.01
Acad. Susp.	61	5.33			
Business Education					
Graduates	72	3.96	89	.428	<.05
Acad. Susp.	41	3.83	Not Significant		
Business Management					
Graduates	246	6.02	134	3.586	>.01
Acad. Susp.	86	5.08			
Economics					
Graduates	21	6.48	3	.539	<.05
Acad. Susp.	4	5.75	Not Significant		

TABLE XLIX

COMPARISON OF DIFFERENCES AMONG ACADEMIC DEPARTMENTS ON HIGH SCHOOL MATHEMATICS GRADES

	N	Mean	d.f.	t-ratio	P
Algebra I					
Accounting					
Graduates	231	2.84	91	2.258	$>.05$
Acad. Susp.	58	2.53			
Business Education					
Graduates	64	3.03	80	5.514	$>.01$
Acad. Susp.	34	2.06			
Business Management					
Graduates	236	2.53	144	4.541	$>.01$
Acad. Susp.	82	1.98			
Economics					
Graduates	21	2.62	4	.521	$<.05$
Acad. Susp.	4	3.00	Not Significant		
Algebra II					
Accounting					
Graduates	162	2.70	51	3.694	$>.01$
Acad. Susp.	33	2.09			
Business Education					
Graduates	12	3.00	21	2.464	$>.05$
Acad. Susp.	9	2.33			
Business Management					
Graduates	159	2.34	64	3.301	$>.01$
Acad. Susp.	40	1.80			
Economics					
Graduates	19	2.37	6	1.162	$<.05$
Acad. Susp.	4	1.75	Not Significant		

TABLE XLIX (continued)

	N	Mean	d.f.	t-ratio	P
Plane Geometry					
Accounting					
Graduates	214	2.82	70	5.944	$>.01$
Acad. Susp.	43	2.05			
Business Education					
Graduates	38	2.74	60	4.624	$>.01$
Acad. Susp.	22	1.82			
Business Management					
Graduates	200	2.32	103	4.577	$>.01$
Acad. Susp.	56	1.75			
Economics					
Graduates	21	2.57	2	1.736	$<.05$
Acad. Susp.	2	3.50	Not Significant		
Trigonometry					
Accounting					
Graduates	91	2.81	10	2.735	$>.05$
Acad. Susp.	10	1.70			
Business Education					
Graduates	2	3.00	2	.477	$<.05$
Acad. Susp.	2	2.50	Not Significant		
Business Management					
Graduates	72	2.61	18	1.923	$<.05$
Acad. Susp.	14	2.00	Not Significant		
Economics					
Graduates	10	2.40	5	.156	$<.05$
Acad. Susp.	2	2.50	Not Significant		
Solid Geometry					
Accounting					
Graduates	52	2.56	10	1.089	$<.05$
Acad. Susp.	9	2.11	Not Significant		

TABLE XLIX (continued)

	N	Mean	d.f.	t-ratio	P
Business Education	*				
Business Management					
Graduates	47	2.49	3	2.059	<.05
Acad. Susp.	4	1.00	Not Significant		
Economics					
Graduates	7	2.43	4	.115	<.05
Acad. Susp.	2	2.50	Not Significant		
High School Math. GPA					
Accounting					
Graduates	238	2.81	99	4.838	>.01
Acad. Susp.	61	2.28			
Business Education					
Graduates	72	2.92	103	6.284	>.01
Acad. Susp.	41	1.98			
Business Management					
Graduates	246	2.49	180	6.146	>.01
Acad. Susp.	86	1.98			
Economics					
Graduates	21	2.57	7	.211	<.05
Acad. Susp.	4	2.50	Not Significant		

*Not Available

among the College of Business academic major departments in grades in high school mathematics courses and grade average in high school mathematics was rejected with the following exceptions: all high school mathematics grades and the grade average in high school mathematics for the students majoring in the Economics Department, all Solid Geometry grades, and Trigonometry grades for Business Education and Business Management majors.

American College Test Results

Question 1. What were the average ACT scores received by students majoring in each academic department in the College of Business? Table L gives an indication of the ACT scores attained by students majoring in each of the four academic departments in the College of Business. The rank order of students majoring in the academic departments of the College of Business was as follows: (1) Economics, (2) Accounting, (3) Business Management, and (4) Business Education. The interesting exception noted in Table L was that Business Education majors received the highest mean score in English.

IV. RELATIONSHIPS

The three major criteria in this study in order of their importance were (1) total university G.P.A., (2) lower-division core G.P.A., and (3) average grades in each of the lower-division core courses. All other predictor variables were correlated with total university G.P.A. and lower-division core G.P.A. Some of the most important predictor

TABLE L

COMPARISON OF AMERICAN COLLEGE TEST RESULTS FOR STUDENTS MAJORING IN EACH OF THE ACADEMIC DEPARTMENTS

	Accounting	Business Education	Business Management	Economics
English ACT	18.95	19.94	17.06	19.44
Mathematics ACT	21.99	16.18	18.87	23.44
Social Science ACT	20.13	18.52	19.47	23.33
Natural Science ACT	21.56	18.31	19.77	22.92
Composite ACT	20.86	18.29	18.98	22.33

variables were correlated with all or selected average grades in lower-division core courses. The Pearson product moment correlation formula (r) was used to determine the correlations which are reported below. Table LXI in Appendix A shows all correlations which were determined regardless of whether or not they are reported in this section. Only the more important correlations were reported here.

Lower-Division Preparation

The most important and the most significant correlations related to lower-division preparation are shown in Table LI. Because none of the variables relating to "year specific lower-division courses were taken" were sufficiently large to consider, only total university, G.P.A., lower-division core G.P.A., and grades received in lower-division core courses were included in this discussion. From this table it can be seen that the lower-division core G.P.A. correlated highly with total university G.P.A. If a business student received a high lower-division core G.P.A. he would probably do well in most of his other university courses. Also the grades in individual core courses correlated well with lower-division core G.P.A. It would be expected that if a student did well in an individual lower-division core course, he would probably do well in the other core courses. Also there was good correlation between individual grades in lower-division core courses and total university G.P.A. For example, the student who did well in Economics 111 could expect to do well in some other university course such as History 170. The intercorrelations between lower-division core courses were fair to good.

TABLE LI

CORRELATIONS OF VARIABLES RELATING TO LOWER-DIVISION PREPARATION

	1.*	2.	3.	4.	5.	6.	7.	8.	9.
1. Total Univ. GPA	1.000	.557	.613	.444	.501	.517	.528	.543	.779
2. Grade Econ 111		1.000	.539	.348					.701
3. Grade Econ 112			1.000			.365		.331	.730
4. Grade Acct 201				1.000	.485	.300			.716
5. Grade Acct 202					1.000	.322	.445		.742
6. Grade Math 105						1.000	.395	.461	.665
7. Grade Stat 221							1.000		.711
8. Grade Math 101								1.000	.499
9. Lower-div Core GPA									1.000

*NOTE: Numbers of columns refer to number of rows. For example, column 1 refers to total university G.P.A.

High School Preparation

The following variables related to high school preparation were correlated with criteria variables of total university G.P.A., lower-division core G.P.A., and grades in lower-division core courses. The correlation ratios are presented in Table LII. Consistent with the research findings reported in the literature, high school G.P.A. and high school rank correlated most highly with total university G.P.A. The .517 and .483 correlations obtained for these variables were consistent with the .50 average correlation between high school performance and university grade point average computed during the freshman year reported by Fishman and Pasanella.[5] The correlations reported in this study were higher than would be expected since 75 per cent of the students involved were graduates. Jacobson reported a correlation of .50 between high school G.P.A. and first year university G.P.A., but a correlation of only .20 between high school G.P.A. and fourth year university G.P.A.[6] The next highest correlations with total university G.P.A. were with G.P.A. in high school social science, .452; grade in high school trigonometry, .450; grade in high school solid geometry, .447; G.P.A. in high school English, .442; and grade in high school Plane Geometry, .419.

Turning to lower-division core G.P.A., it was again found that high school G.P.A. and high school decile rank correlated most highly.

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[5] Fishman and Pasanella, *Review of Educational Research*, 300.

[6] Jacobson, *Journal of Higher Education*, 436.

TABLE LII

CORRELATIONS OF VARIABLES RELATED TO HIGH SCHOOL PREPARATION

	Total Univ. GPA	Grade Econ 111	Grade Econ 112	Grade Acct 201	Grade Acct 202	Grade Math 105	Grade Stat 221	Grade Math 101	Lower-div. core GPA
No. of HS Sem Units Math	.076	.150	.089	.051	.036	.176	.195	.160	.163
Grade HS Algebra I	.296	.206	.213	.250	.238	.357	.254	.379	.346
Grade HS Algebra II	.397	.243	.232	.247	.277	.357	.326	.277	.403
Grade HS Pl. Geometry	.419	.198	.286	.311	.260	.362	.328	.266	.444
Grade HS Trigonometry	.450								.413
Grade HS Sld. Geometry	.447								.413
GPA in HS Mathematics	.399	.207	.259	.305	.284	.386	.316	.346	.409
GPA in HS English	.442	.293		.251					.399
GPA in HS Science	.389	.289		.208					.371
Grade in HS Economics	.366	.356	.273						.261
GPA in HS Soc. Science	.452	.378	.346	.225		.347			.428
Grade in HS Typewriting	.268								.248
Grade in HS Bookkeeping	.343			.264	.234				.376
GPA in HS Business	.279								.267
High School GPA	.517	.359	.345	.249	.302	.409	.336	.305	.494
High School Stanine Rank	.483	.324	.277	.314	.289	.364	.314	.304	.451

Other variables which correlated highly with lower-division core G.P.A. were as follows: grade in high school Plane Geometry, .444; G.P.A. in high school social science, .428; grade in high school trigonometry and Solid Geometry, .413; G.P.A. in high school mathematics, .409; and grade in high school Algebra II, .403. The following percentages of graduates and academically suspended students had scores for each of these variables:

	Graduates	Academically Suspended
Plane Geometry	81%	63%
Soc. Sc. G.P.A.	100	100
Trigonometry	30	14
Sold. Geom. Grade	18	8
Math G.P.A.	100	100
Algebra II Grade	61	44

Thus, it can be seen that except for trigonometry and solid geometry, all of these variables are rather wide spread. It is safe to assume that only the better students would be taking trigonometry and solid geometry; therefore, a high correlation could be expected. In the other variables since a high percentage of both graduates and academically suspended students are involved, it can be assumed that there is something about the variables themselves which affect the high correlations.

American College Test Results

Finally, the relationship between the American College Test results and the criteria variables of total university G.P.A., lower-division core G.P.A., and grades in lower-division core courses were studied. The results of these correlation analyses are shown in Table LIII. With few exceptions the Composite ACT score correlates most highly with each variable. The Composite ACT score, English ACT score,

TABLE LIII

CORRELATIONS OF VARIABLES RELATING TO AMERICAN COLLEGE TEST RESULTS

	Total Univ. GPA	Grade Econ 111	Grade Econ 112	Grade Acct 201	Grade Acct 202	Grade Math 105	Grade Stat 221	Grade Math 101	Lower-div Core GPA
Composite ACT	.421	.482	.487	.352	.446	.388	.453	.265	.574
Mathematics ACT	.232	.308	.360	.291	.454	.396	.491	.251	.473
English ACT	.408	.384	.412	.288	.288	.376	.327	.310	.432
Social Science ACT	.393	.466	.418	.272	.298	.238	.303	.278	.472
Natural Science ACT	.389	.421	.428	.292	.422	.276	.360	.132	.488

Social Science ACT score, and Natural Science ACT score correlate most highly with total university G.P.A. The mathematics ACT has a much lower correlation than all of the other scores with the total university G.P.A. All of the ACT scores correlate well with lower-division core G.P.A. with the Composite ACT score having the highest correlation and English ACT score the lowest. Composite ACT score shows the best correlation with grade in Economics 111, Economics 112, and Accounting 201. Mathematics ACT score had the highest correlation of all of the ACT scores with Accounting 202 and Statistics 221. Surprisingly the highest correlation with Mathematics 101 was English ACT score. High school G.P.A. had the highest correlation with Mathematics 105.

V. SUMMARY

This chapter presented the findings of this study. The findings were in three forms. First, frequency distributions and percentages described the variables. Second, statistical tests were conducted to determine if differences in the variables were statistically significant. Third, simple product moment correlation ratios were calculated to determine to what degree relationship between selected variables existed.

Major sections of this chapter were as follows: (1) Academic Status, (2) Transfer Status, (3) Major Department and Sex, and (4) Relationships. Variables were classified by three major groups: lower-division preparation, high school preparation, and American College Test results. Only the more important findings are included in the following summary.

Of the total group studied there were three graduates for every student academically suspended in the College of Business. The majority (58 per cent) of all students academically suspended were either freshmen or sophomores. The total university G.P.A. and the lower-division core G.P.A. of graduates were significantly higher than for academically suspended students. Students received significantly higher grades in lower-division core courses at other colleges and universities than they received at Brigham Young University. Six out of ten graduates achieved a 2.4 (C+) and above G.P.A. in lower-division core courses while only one out of ten of the academically suspended students were able to achieve at this level. Approximately one-third of the graduates did not achieve a 2.25 grade point average in lower-division core courses which is the minimum standard required by the Business Fundamentals Division. About 85 per cent of the graduates and 26 per cent of the academically suspended students were able to attain a 2.0 (C) lower-division core G.P.A. College of Business graduates received a mean G.P.A. which was significantly lower than all Brigham Young University Seniors.

Graduates tended to take College of Business lower-division core courses one semester later in their academic program than academically suspended students. Graduates took Mathematics 101 during their Freshman year; Economics, Accounting, and Mathematics 105 during their Sophomore year; and Statistics during their Junior year. Differences between graduates and academically suspended students in year lower-division core courses were taken were significant except for Statistics 221 and

Mathematics 101. Graduates earned grades in lower-division core courses which were significantly higher than those earned by academically suspended students.

There was no statistically significant difference between graduates and academically suspended students in the number of times lower-division core courses were repeated. There was a significant difference in the number of semester hours of credit transferred to Brigham Young University with graduates transferring the larger number of hours.

Graduates took a significantly larger number of units of mathematics and science in high school as compared with academically suspended students. The number of units of high school social science and business taken by academically suspended students was significantly larger than the number taken by graduates. The difference between the two groups in the number of units of English taken in high school was not significant. More of the students who took advanced high school courses in mathematics (Plane Geometry, Algebra II, Trigonometry, and Solid Geometry) tended to graduate from the College of Business and fewer who took these courses tended to be academically suspended.

There is a significant difference between College of Business graduates and academically suspended students in high school grade point average (mathematics, English, science, social science, business, and total). There were also significant differences between the two groups in the following high school subjects: Algebra I, Algebra II, Plane Geometry, Trigonometry, Economics, Typewriting, and Bookkeeping. High school business grades were the highest of any high school grades studied.

College of Business graduates achieved a high school G.P.A. of 2.70 and ranked six out of nine in their high school graduating class (nine being high). Academically suspended students attained a 2.15 high school G.P.A. and a mean stanine rank of four out of nine. This difference in high school stanine rank was significant.

About 57 per cent of the graduates majored in a high school preparatory program while 36 per cent majored in business. There was a statistically significant difference between College of Business graduates and academically suspended students in number of students taking each high school major.

College of Business graduates achieved the following mean scores on the American College Test: Composite, 20.98; Mathematics, 21.03; English, 20.01; Social Science, 21.12; and Natural Science, 21.25. Academically suspended students scored as follows: Composite, 17.42; Mathematics, 17.09; English, 16.36; Social Science, 17.42; and Natural Science, 18.40. A cut-off composite ACT score of 20 included 64 per cent of the graduates and 37 per cent of the academically suspended students. College of Business graduates achieved significantly higher scores than academically suspended students on the ACT.

About 55 per cent of the graduates were non-transfer students while 45 per cent were transfer students. Sixty-three per cent of the academically suspended students were non-transfer students while 37 per cent were transfer students. Eighty per cent of the total group were either native (non-transfer) students or junior college transfer students. There is a significant difference in transfer status between graduates of the College of Business and business students who were academically suspended. There were statistically significant differences in mean total university and lower-division core G.P.A. among transfer and non-transfer graduates and academically suspended students. Transfer students received a significantly higher lower-division core G.P.A. than non-transfer students. There was no significant difference between transfer students and non-transfer students on lower-division core G.P.A. achieved at Brigham Young University.

There was no significant difference between transfer and non-transfer students in the number of high school units of mathematics, English, and science taken. The non-transfer students did take a significantly larger number of high school units of social science and business.

Non-transfer students received significantly higher grade point averages in high school mathematics, English, social science, and overall high school grades. The high school stanine rank for the non-transfer students was also significantly higher. There was no significant difference between transfer and non-transfer students in mean composite ACT scores.

While only 15 per cent of the total group was female, 20 per cent of the academically suspended students were female. There was a significant difference in the number of students who were male and the number who were female in the graduate and academically suspended groups.

While 38 per cent of the total group majored in the Accounting Department, only 32 per cent of the students who were academically suspended majored in Accounting. In the Business Education Department, only 15 per cent of the total group had this major while 21 per cent of the academically suspended group were Business Education majors. There was a significant difference in number of students majoring in each academic department when graduates and academically suspended students were compared. There are also statistically significant differences among College of Business departments in the mean total university and lower-division core G.P.A.

All of the students majoring in Accounting, Business Management, and Economics took an average of approximately three years of high school mathematics. Business Education majors averaged two years of high school mathematics. There was a significant difference in the Accounting Department and the Business Management Department between graduates and academically suspended students in the number of high school units of mathematics completed. These differences were not significant for the students majoring in Business Education and Economics.

Accounting majors achieved the highest grade point average in high school mathematics with Business Education ranking second, Economics third and Business Management fourth. Business Education graduates ranked first in their high school mathematics grade point average when departmental graduates only were compared. There were significant differences between graduates and academically suspended students in the Accounting, Business Education, and Business Management Departments in G.P.A. in high school mathematics and in grades for Algebra I and II, and Plane Geometry. The difference in Trigonometry grades between the groups for the Accounting Department was also significant.

The rank order of students majoring in the academic departments of the College of Business for scores on the American College Test was as follows: (1) Economics, (2) Accounting, (3) Business Management, and (4) Business Education. The only exception to this ranking was in the English ACT in which Business Education students ranked first.

The highest correlations with total university G.P.A. in order of magnitude were as follows: lower-division core G.P.A., grades in lower-division courses, high school G.P.A., high school stanine rank, G.P.A. in high school social science, grades in high school trigonometry and solid geometry, G.P.A. in high school English, Composite ACT score, grade in high school plane geometry, and English ACT score. The highest correlations with lower-division core G.P.A. in order of magnitude were as follows: grades in lower-division core courses, Composite ACT score, high school G.P.A., Natural Science ACT score, Mathematics ACT score, Social Science ACT score, high school rank, grade in high school plane geometry, English ACT, G.P.A. in high school social science, grade in high school trigonometry, grade in high school solid geometry, G.P.A. in high school mathematics, and grade in high school Algebra II. The best single predictors for each of the lower-division core courses were as follows: Composite ACT score for Economics 111, Economics 112, and Accounting 201; Mathematics ACT score for Mathematics 105, Accounting 202, and Statistics 221; and grade in high school Algebra I for Mathematics 101.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This study was designed to determine admission requirements for freshman and transfer students in the College of Business. Investigations were made in three major areas as follows: (1) lower-division collegiate preparation, (2) high school preparation, and (3) American College Test results. Hypotheses were ~~then~~ developed to determine significances of differences between related variables. Relationships between collegiate grade point averages and other selected variables were determined. The two major groups involved in this study were College of Business students who were either graduates or who were academically suspended from the university.

A review of the literature was made to determine what factors relate to university success in general and success in the College of Business in particular. Admission practices of other colleges of business in major universities in the West were reviewed.

This study was conducted at Brigham Young University during the 1966-67 school year using records of students who graduated or who were academically suspended during 1965 and 1966. Data were collected from high school transcripts, university transcripts, and ACT test scores. Frequency distributions, statistical tests of difference, and correlation analysis tests were processed on the computer for 783 samples. Significantly different variables which showed a high correlation with university grade point average, lower-division core grade point average, and grades in specific lower-division core courses were considered for selection as admission requirements to the College of Business.

I. SUMMARY OF FINDINGS

The findings of this study were divided into the following sections: (1) Academic Status, (2) Transfer Status, (3) Major Department and Sex, and (4) Relationship of variables. Within each section the following subfactors (variables) were examined: (1) lower-division preparation, (2) high school preparation, and (3) American College Test scores.

Academic Status

Lower-division preparation.

1. Of the total group studied there were three graduates for every academically suspended student in the College of Business. During 1965 and 1966 the College of Business at Brigham Young University graduated 17 per cent of its average enrollment while 6 per cent of the students were suspended for academic reasons.

2. The percentage of academically suspended students categorized by class at the time they were suspended was as follows: freshman, 35 per cent; sophomore, 23 per cent; junior, 27 per cent; and senior, 15 per cent. The majority (58 per cent) of all students academically suspended were either freshmen or sophomores. However, there were more juniors than sophomores suspended.

3. Graduates earned total university and lower-division core G.P.A.'s which were significantly higher than those earned by

academically suspended students. Grades earned in lower-division core courses were lower than those in courses taken outside the College of Business.

4. Transfer students received significantly higher grades in lower-division core courses at former colleges and universities than in those lower-division core courses taken at Brigham Young University.

5. Six out of ten graduates achieved a 2.4 (C+) or higher G.P.A. in lower-division core courses while only one out of ten of the academically suspended students were able to achieve at this level. No graduate achieved a "D" or lower grade point average in lower-division core courses. No student who was academically suspended earned a B+ or higher lower-division core G.P.A. Approximately one-third of the graduates did not achieve a 2.25 grade point average in lower-division core courses which is the minimum standard required by the Business Fundamentals Division for transfer to a regular department in the College of Business. Approximately 85 per cent of the graduates and 26 per cent of the academically suspended students attained a 2.0 (C) lower-division core G.P.A.

6. Business graduates earned a total university G.P.A. of 2.61 and a lower-division core G.P.A. of 2.55 which are significantly lower than the total university G.P.A. of 2.75 earned by all Brigham Young University seniors.

7. Mean G.P.A.'s attained in lower-division core courses are as follows:

	Economics		Accounting		Mathematics		Statistics
	111	112	201	202	105	101	221
Graduates	2.65	2.57	2.76	2.58	2.41	2.51	2.39
Acad. Susp.	1.54	1.54	1.86	1.75	1.55	1.48	1.46

The differences in G.P.A. between graduates and academically suspended students are statistically significant beyond the .01 level of confidence.

8. The lower-division core courses were taken by the following percentages of students: Economics 111, 93 per cent; Economics 112, 78 per cent; Accounting 201, 89 per cent; Accounting 202, 77 per cent; Mathematics 105, 68 per cent; Statistics 221, 72 per cent; and Mathematics 101, 38 per cent.

9. The following percentages of graduates were able to achieve a 2.4 (C+) grade average in the following lower-division core courses: Economics 111, 62 per cent; Economics 112, 57 per cent; Accounting 201, 66 per cent; Accounting 202, 57 per cent; Mathematics 105, 45 per cent; Statistics 221, 47 per cent; and Mathematics 101, 50 per cent. The percentage of graduates receiving a 2.4 grade point average or higher is much lower for Mathematics 101 and 105, and Statistics 221 than for other lower-division core courses. Approximately 80 per cent of the graduates were able to attain an average of 2.0 or higher in Mathematics 101 and 105, and Statistics 221.

10. Graduates tended to take College of Business lower-division core courses one semester later in their academic program than was true of academically suspended students. Graduates took Mathematics 101 during the Freshman year; Economics, Accounting, and Mathematics 105

during the Sophomore year; and Statistics 221 during the Junior year. Differences between graduates and academically suspended students in the year in which lower-division core courses were taken were significant except for Statistics 221 and Mathematics 101.

11. There was no statistically significant difference between graduates and academically suspended students in the number of times lower-division core courses were repeated.

12. Graduates transferred an average of 22.63 semester hours of credit from other institutions of higher education, whereas, academically suspended students transferred an average of 14.36 semester hours. This difference was statistically significant.

High school preparation.

1. Graduates took a significantly greater number of units of mathematics and science in high school when compared with academically suspended students. The number of units of high school social science and business taken by academically suspended students was significantly higher than the number taken by graduates. The difference between the two groups in the number of units of English taken in high school was not significant. College of Business graduates completed the following number of years in high school subjects: mathematics, 2.94; English, 3.66; science, 2.46; social science, 2.86; and business, 1.55. Academically suspended students completed the following number of years in high school subjects: mathematics, 2.47; English, 3.64; science, 2.11; social science, 3.02; and business, 1.90.

2. Students who took a greater number of advanced high school courses in mathematics (Plane Geometry, Algebra II, Trigonometry, and Solid Geometry) tended to graduate from the College of Business while those who took fewer advanced courses tended to be academically suspended.

3. College of Business students achieved the following grade point averages:

	Graduates	Academically Suspended
Mathematics	2.68	2.07
English	2.73	2.16
Science	2.61	2.04
Social Science	2.89	2.28
Business	2.89	2.53
Overall high school	2.70	2.15

All of these differences were statistically significant.

4. The following average grades were achieved:

	Graduates	Academically Suspended
Algebra I	2.72	2.20
Algebra II	2.52	1.98
Plane Geometry	2.59	1.89
Trigonometry	2.69	1.96
Solid Geometry	2.52	1.94

All of these differences were statistically significant except for Solid Geometry.

5. Average grades were achieved as follows in specific high school courses:

	Graduates	Academically Suspended
Chemistry	2.48	1.74
Physics	2.54	2.25
U.S. History	2.77	2.13
Civics	2.88	2.28
Economics	2.83	2.42
Typewriting	2.80	2.41
Shorthand	3.21	2.26
Bookkeeping	3.14	2.70
General Business	3.01	2.60

Differences for economics, typewriting, and bookkeeping were tested for significance and were found to be statistically significant.

6. High school business grades were the highest of all high school grades examined.

7. College of Business graduates ranked in the upper third of their high school graduating class while academically suspended students ranked in the upper two-thirds. This difference between the two groups in stanine rank was statistically significant.

8. Fifty-seven per cent of the College of Business graduates majored in a high school college preparatory program as opposed to 46 per cent of the academically suspended students. Thirty-six per cent of the graduates majored in a high school business program as contrasted with 48 per cent of the academically suspended students. These percentage differences were found to be statistically significant.

American College Test results.

1. College of Business students achieved the following mean scores on the American College Test:

	Graduates	Academically suspended
Composite	20.98	17.42
Mathematics	21.03	17.09
English	20.01	16.36
Social Science	21.12	17.42
Natural Science	21.25	18.40

The differences between the groups were statistically significant.

2. A cut-off composite ACT score of 20 included 64 per cent of the graduates and 37 per cent of the academically suspended students.

Transfer Status

Lower-division preparation.

1. Approximately 55 per cent of the graduates were non-transfer students while 45 per cent were transfer students. Sixty-three per cent of the academically suspended students were non-transfer students while 37 per cent were transfer students. Eighty per cent of the total group were either non-transfer students or junior college transfer students. The difference in number of graduate and academically suspended students in transfer and non-transfer categories was significantly different from that expected.

2. There were statistically significant differences in mean total university and lower-division core G.P.A. among transfer and non-transfer graduates and academically suspended students. Considering transfer students only, there was no significant difference between College of Business graduates and academically suspended students in the grade received at other colleges or universities in lower-division core courses. Transfer students received a significantly higher lower-

division core G.P.A. than non-transfer students. There was, however, no significant difference between transfer and non-transfer students on lower-division core G.P.A. achieved at Brigham Young University.

3. Non-transfer students took lower-division core courses earlier than transfer students.

4. There is no statistically significant difference between transfer and non-transfer students in the number of times lower-division core courses were repeated.

High school preparation.

1. There was no significant difference between transfer and non-transfer students in the number of high school units of mathematics, English, and science taken. The non-transfer students did take a significantly larger number of high school units of social science and business.

2. Non-transfer students received significantly higher grade point averages in high school mathematics, English, social science, and overall high school grades. Grade averages were as follows:

	Transfer	Non-Transfer
Mathematics	2.46	2.59
English	2.46	2.68
Social science	2.64	2.80
Overall high school	2.49	2.62

3. Non-transfer students achieved significantly higher stanine rank in their high school graduating class when compared with transfer students.

American College Test results.

1. Transfer students attained a composite score of 20.27 on the ACT which is not significantly different from the composite score of 19.44 achieved by non-transfer students.

Major Department and Sex

1. Eighty-five per cent of the total group were males and 15 per cent were females. Fourteen per cent of the graduates were females and 20 per cent of the academically suspended students were females. This was a significant difference from that expected in the number of each sex included in the graduate and academically suspended groups.

2. While 38 per cent of the total group majored in the Accounting Department, 32 per cent of the students who were academically suspended majored in Accounting. Fifteen per cent of the total group majored in the Business Education Department while 21 per cent of the academically suspended students were from this department. There was a significant difference in the number of students majoring in each academic department when graduates and academically suspended students were compared.

Lower-division preparation.

1. Accounting students earned higher grades in lower-division core courses than in other university courses. Business Education and Business Management majors tended to do better in other university courses than in lower-division core courses. Business Education graduates achieved a 2.71 G.P.A. in university courses compared with a 2.38 G.P.A. in lower-division core courses. Business Management graduates

achieved a 2.49 G.P.A. in university courses compared with 2.35 G.P.A. in lower-division core courses. Economics majors did equally well in both areas.

2. There were statistically significant differences among College of Business departments in the mean total university and lower-division core G.P.A.'s attained.

High school preparation.

1. Students majoring in Accounting, Business Management, and Economics completed an average of three years of high school mathematics. Business Education majors averaged two years of high school mathematics. There was a significant difference in the Accounting Department and in the Business Management Department between graduates and academically suspended students in the number of high school units of mathematics completed. These differences were not significant for the students majoring in Business Education and Economics.

2. Accounting majors achieved the highest grade point average (2.70) in high school mathematics with Business Education ranking second (2.58), Economics third (2.56), and Business Management fourth (2.35). Business Education graduates ranked first in their high school mathematics grade point average when departmental graduates only were compared. There were significant differences between graduates and academically suspended students in the Accounting, Business Education, and Business Management Departments in G.P.A. in high school mathematics and in grades earned in Algebra I and II, and Plane Geometry.

The differences in Trigonometry grades between the groups for the Accounting Department were also significant.

American College Test results.

1. The rank order of students majoring in the academic departments of the College of Business for scores on the American College Test was as follows: (1) Economics, (2) Accounting, (3) Business Management, and (4) Business Education. The only exception to this ranking was in the English ACT in which Business Education students ranked first. ACT composite scores were as follows: Economics, 22.33; Accounting, 20.86; Business Management, 18.98; and Business Education, 18.29.

Relationships

1. The highest correlations with total university G.P.A., lower-division core G.P.A., and grades in lower-division core courses in order of magnitude were as follows:

	Total Univ. G.P.A.	Lower-Division Core G.P.A.
Lower-division core G.P.A.	.779	.
Grades in lower-division core courses	.444 to .557	.665 to .742
High school G.P.A.	.517	.494
High school rank	.483	.451
G.P.A. in high school social science	.452	.428
Grade in high school trigonometry	.450	.413
Grade in high school solid geometry	.447	.413

	Total Univ. G.P.A.	Lower-Division Core G.P.A.
G.P.A. in high school English	.442	
Composite ACT score	.421	.574
Grade in high school plane geometry	.419	.444
English ACT score	.408	.432
Natural science ACT score		.488
Mathematics ACT score		.473
Social science ACT score		.472
G.P.A. in high school mathematics		.409
Grade in intermediate high school algebra		.403

2. The best single predictors for grades in each of the lower-division core courses were as follows: Composite ACT score for Economics 111 (.482), Economics 112 (.487), and Accounting 201 (.352); Mathematics ACT score for Mathematics 105 (.396), Accounting 202 (.454), and Statistics 221 (.491); and grade in high school Algebra I for Mathematics 101 (.379).

II. CONCLUSIONS

The following conclusions were based upon the findings obtained in this study:

Lower-Division Preparation

1. Students with higher grades in College of Business lower-division core courses can be expected to graduate from the university with a high grade point average.

2. Those students in the College of Business who take part of their lower-division core requirements at another institution of higher education have a higher probability of graduating than those students who have taken all of their lower-division core courses at Brigham Young University.

3. Students in the College of Business are able to achieve higher grades in lower-division core economics and accounting courses than in mathematics and statistics courses.

4. Students possessing the better chance for success in the College of Business are those who take mathematics during their freshman year, economics and accounting during their sophomore year, and statistics during their junior year.

5. The overall grade point average of Brigham Young University graduating seniors is significantly higher than College of Business graduates.

6. The number of times lower-division core courses are repeated does not significantly influence the probability that a student will graduate.

7. Transfer students, both graduates and academically suspended, receive higher grades in lower-division core courses at other institutions of higher education than earned while attending Brigham Young University.

8. Non-transfer students take lower-division core courses earlier than transfer students.

9. Accounting students earn higher grades in lower-division core courses than in other university courses. Business Education and

Business Management majors achieve higher grades in other university courses than in lower-division core courses. Differences among departments in both lower-division core G.P.A. and total university G.P.A. are statistically significant.

High School Preparation

Generally, students who achieve in high school have a good chance of graduating from the College of Business with a high grade point average. Following are conclusions pertaining to high school preparation:

1. Students who complete more semesters of high school mathematics and science enhance their chance of graduating from the College of Business.

2. Students who attain higher overall grade point averages in high school and earn high grades in specific disciplines such as English and mathematics have an excellent chance of succeeding in the College of Business.

3. Students who rank in the upper third of their high school graduating class are more likely to graduate in the College of Business than those students who rank in the lower two-thirds of their high school graduating class.

4. High school students majoring in a college preparatory program are more likely to graduate from the College of Business than are high school students who major in business or other high school majors.

5. There is no significant difference between transfer and nontransfer students in the number of units of high school mathematics,

English, and science completed. Non-transfer students take a significantly higher number of units of high school social science and business.

6. Non-transfer students receive significantly higher grade point averages in high school mathematics, English, social science, and overall high school grades. They also receive a significantly higher rank in their graduating class as compared with transfer students.

7. Accounting, Business Management, and Economics majors take more high school mathematics than Business Education majors. The differences between graduates and academically suspended students in number of high school semesters of mathematics taken are significant for Accounting and Business Management majors, but not for Business Education and Economics majors.

8. Accounting majors achieve the highest grade point average in high school mathematics with Business Education majors ranking second, Economics majors third, and Business Management majors fourth.

9. Graduates majoring in each of the academic departments except Economics achieve significantly higher grades in high school mathematics than academically suspended students.

American College Test Results.

The following conclusions were drawn about American College Test results:

1. College of Business graduates achieve significantly higher scores on the American College Test than students who are academically suspended.

2. There is no significant difference between transfer and non-transfer students on composite scores of the American College Test.

3. The rank order of students majoring in the academic departments of the College of Business on American College Test scores are as follows: (1) Economics, (2) Accounting, (3) Business Management, and (4) Business Education. The only exception to this ranking is in the English ACT in which Business Education ranks first.

Relationships

1. The highest correlations with total university G.P.A. in order of magnitude are as follows: lower-division core G.P.A., grades in lower-division core courses, high school G.P.A., rank in high school graduating class, grades in certain high school subjects, and ACT scores.

2. The highest correlations with lower-division core G.P.A. are as follows: grades in lower-division core courses, ACT scores, high school G.P.A., rank in high school graduating class, and grades in certain high school courses.

3. The best single predictors for each of the lower-division core courses are as follows: Composite ACT score for Economics 111 and 112, and Accounting 201; Mathematics ACT scores for Mathematics 105, Accounting 202, and Statistics 221; and grade earned in high school Algebra I for Mathematics 101.

III. RECOMMENDATIONS

Based on the findings and conclusions of this study some recommendations concerning admission requirements for the College of Business are made. Recommendations pertaining to the Business Fundamentals Division are also included. There was no intent to imply a cause-and-effect relationship. Those students who meet these requirements are likely to succeed in the College of Business.

1. All freshman applicants should be required to meet the following requirements before being authorized to register in the College of Business:

   a. complete three units of high school mathematics including Algebra I, Algebra II, and Plane Geometry

   b. earn an overall high school mathematics grade of B- (2.7) or higher with a B- or higher grade in Algebra I, and a C+ (2.4) or higher grade in Plane Geometry and Algebra II

   c. attain a B- or higher overall high school grade average

   d. attain a standard composite score of 20 or higher on the American College Test.

2. Any freshman applicant who qualifies for admission to the Brigham Young University, but does not qualify on one or more of the above standards, should be required to complete whichever of the following requirements that are applicable:

   a. if he has not completed the mathematics courses with the stipulated grades, he would be required to register for Mathematics 101 and earn a grade of C or better

   b. if he had not earned a B- or better overall high school grade average or a standard composite score of 20 or better on the American College Test, he would be required to achieve a 2.0 (C) average in lower-division core courses before he would be allowed to register for College of Business upper-division courses.

3. Transfer students coming into the College of Business must have attained an overall grade point average of 2.25 in lower-division core courses with not less than a C in any individual lower-division core course.

4. The admission requirements listed above should be applied to the records of students in the College of Business who were new during the school year 1966-67 to determine what impact these recommendations would have.

5. For students who qualify to register in the College of Business by meeting the requirements listed above, the lower-division core G.P.A. requirement for transfer to an upper-division academic business major from the Business Fundamentals Division should be changed to 2.0 from the 2.25 G.P.A. which is currently required. Transfer students would still be required to attain a 2.25 G.P.A. in lower-division core courses taken elsewhere and a 2.0 G.P.A. in those core courses taken at Brigham Young University.

6. Recommended semester for taking lower-division core courses should be changed to the following: Mathematics 101 (if required), first semester; Mathematics 108, second semester; economics and accounting, third and fourth semester; Statistics 221, fifth semester. Statistics 221 should be renumbered as an upper-division course and should no longer be required by the Business Fundamentals Division as a lower-division core requirement.

IV. RECOMMENDATIONS FOR FURTHER RESEARCH

The findings of this study suggest the need for other pertinent research.

1. A study should be made to determine why Business Education and Business Management majors earn lower grades in lower-division core courses than in other university courses.

2. Lower grades generally achieved by students in lower-division core courses suggest a need for review of course objectives and grading practices. The feasibility of using standardized testing and grading practices in lower-division core courses should be investigated.

3. The relationship of general education requirements to success in the College of Business should be determined.

4. The relationship of lower-division core requirements to upper-division core requirements and to major departmental requirements should be determined.

5. The effect of repeating courses should be considered in further detail.

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APPENDIX A

DETAILED TABLES

TABLE LIV

COMPARISON OF COLLEGE OF BUSINESS
LOWER-DIVISION PREPARATION FOR
SELECTED UNIVERSITIES

College Lower-Division Preparation	U.C. at Berkeley	U. of Colorado	U. of Kansas	U. of Missouri at K.C.	U. of Oregon	Wash. Univ.
A. Semester hours of college credit requirement	Approx 60	60	50-59	56	Approx 60	Approx 60
B. College GPA Required	C	C	C	C	C[b]	
1. English	9	6	6-9			6
2. Mathematics	3	6	305		2 2/3	6
3. Foreign Language	8	6[a]				
4. Social Science	6	a.d.	3			12[c]
5. Economics	6	6	5-6		6	6
6. Statistics	3				2	3
7. Accounting	6		6		4	6
8. Natural Science		a.d.	5-6		6	6
9. English Literature Classics, Hum., Phil.		e.	3			12
10. Intro. to Business		2				
11. Speech					2	3
12. Business Law					2	
13. Written Business Communications					2	
14. Other						

(TABLE LIV (continued)

College Lower-Division Preparation	San Diego State College	Arlington State Col. U. of Texas	Wash. Univ. St. Louis	U. of Utah	U. of Oklahoma	Arizona State
A. Sem. Hrs. of college credit requirement			Approx 60		26[j]	
B. College GPA required				C	C	C
1. English		12	6		6	
2. Mathematics	3	6	6		3-5	
3. Foreign Language						
4. Social Science		15	6[f]			
5. Economics	6	6	6			6
6. Statistics	3		3			
7. Accounting	4	6	6			
8. Natural Science		6	6			
9. Eng. Lit. Classics, Hum., Phil.			12[f]			
10. Intro. to Business						
11. Speech		3	3			
12. Business Law	6					
13. Written Business Communications	3					
14. Other		12		i.		g.

Legend: (next page)

a. Strongly recommended

b. In English Composition

c. Included 6 semester hours of Gen. Psych., also, 6 semester hours of humanities may be substituted

d. 18 hours of social science and natural science referred

e. May substitute for foreign language requirement

f. Should choose 6 additional hours either in social sciences or humanities

g. Before entering third & fourth year professional program, must complete lower-division business core courses (numbered below 300) with GPA of 2.0 as well as 32 semester hours of general education courses

h. May spend either first two years in college of liberal arts or college of business

i. Must maintain dual enrollment in college of letters and science and in college of business until general education requirements of the university are completed

j. First year students are enrolled in the general college

TABLE LV

GRADES RECEIVED BY GRADUATES AND ACADEMICALLY SUSPENDED STUDENTS IN LOWER-DIVISION CORE COURSES

	Economics 111				Economics 112				Accounting 201				Accounting 202			
	Grad		Acad Susp		Grad		Acad Susp		Grad		Acad Susp		Grad		Acad Susp	
Grade	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
A	51	8.7	1	.7	37	6.9	0	0.0	81	13.8	6	5.2	61	11.1	4	6.6
A-	24	4.0	1	.7	23	4.3	0	0.0	29	4.9	1	.9	17	3.1	0	0.0
B+	32	5.0	1	.7	38	7.1	0	0.0	40	6.8	2	1.7	44	8.0	1	1.6
B	154	26.0	7	4.9	111	20.6	7	8.1	154	26.2	20	17.4	107	19.5	6	9.8
B-	51	8.6	3	2.1	40	7.5	2	2.3	45	7.7	1	.9	45	8.1	4	6.6
C+	50	8.5	2	1.4	54	10.1	3	3.5	36	6.1	6	5.2	39	7.1	0	0.0
C	173	29.0	41	28.9	168	31.5	24	27.9	151	25.7	29	25.2	136	24.8	15	24.6
C-	22	3.7	18	12.7	28	5.2	10	11.6	31	5.3	7	6.1	51	9.3	6	9.8
D+	5	1.8	8	5.6	7	1.3	5	5.8	5	.9	5	4.3	10	1.8	1	1.6
D	22	3.7	27	19.0	21	3.9	14	16.3	10	1.7	13	11.3	31	5.6	8	13.1
D-	0	0.0	17	12.0	2	.4	7	8.1	1	.2	9	7.8	7	1.3	7	11.5
E	1	.2	16	11.3	1	.2	14	16.3	3	.5	16	13.9	1	.2	9	14.8
Total	587	100	142	100	534	100	86	100	587	100	115	100	549	100	61	100

	Mathematics 105				Statistics 221				Mathematics 101			
	Grad		Acad Susp		Grad		Acad Susp		Grad		Acad Susp	
Grade	N	%	N	%	N	%	N	%	N	%	N	%
A	36	8.0	4	4.7	17	3.2	0	0.0	27	11.8	1	1.3
A-	15	3.3	0	0.0	25	4.7	0	0.0	6	2.6	1	1.3
B+	14	3.1	0	0.0	36	6.8	0	0.0	5	2.2	0	0.0
B	82	18.3	3	3.5	72	13.6	2	5.4	59	25.8	8	10.3
B-	26	5.8	1	1.2	44	8.3	1	2.7	5	2.2	1	1.3
C+	30	6.7	2	2.3	55	10.4	2	5.4	13	5.7	1	1.3
C	151	33.7	24	27.9	162	30.6	9	24.3	75	32.8	18	23.1
C-	32	7.1	11	12.8	59	11.2	6	16.2	5	2.2	9	11.5
D+	9	2.0	6	7.0	25	4.7	1	2.7	5	2.2	1	1.3
D	45	10.0	14	16.3	25	4.7	4	10.8	23	10.0	13	16.7
D-	4	.9	2	2.3	9	1.7	3	8.1	1	.4	2	2.6
E	3	.7	19	22.1	0	0.0	9	24.3	4	1.7	23	29.5
Total	448	100	86	100	529	100	37	100	229	100	78	100

TABLE LVI

YEAR LOWER-DIVISION CORE COURSES TAKEN

Year Taken	Economics 111		Economics 112		Accounting 201		Accounting 202	
	N	%	N	%	N	%	N	%
0	58	7	172	22	85	11	178	23
1	271	35	97	12	143	18	64	8
2	291	37	214	27	369	47	224	29
3	129	16	204	26	158	20	229	29
4	29	4	82	10	24	3	69	9
5	6	1	14	2	6	1	19	2
6	1	a.	2	a.	0	0	2	a.
7	0	0	0	0	0	0	0	0
Mean Yr. taken	1.9		2.5		2.1		2.6	

Year Taken	Mathematics 105		Statistics 221		Mathematics 101	
	N	%	N	%	N	%
0	249	32	223	28	485	62
1	275	35	11	1	203	26
2	81	10	144	18	55	7
3	104	13	237	30	33	4
4	58	7	121	15	9	1
5	14	2	43	5	0	0
6	4	1	5	1	0	0
7	0	0	1	a.	0	0
Mean Yr. taken	2.0		3.1		1.5	

a = less than 1 per cent

TABLE LVII

SEMESTER UNITS OF HIGH SCHOOL MATHEMATICS TAKEN

	Graduates				Acad. Susp.				Total Group			
	N	%	C% (0-9)	C% (9-0)	N	%	C% (0-9)	C% (9-0)	N	%	C% (0-9)	C% (9-0)
0	11	2	3	100	7	4	4	100	18	2	2	100
1	3	1	3	98	1	0	4	96	4	1	3	98
2	26	4	7	97	21	11	15	96	47	6	9	97
3	7	1	8	93	9	5	20	85	16	2	11	91
4	131	22	30	92	57	29	49	80	188	24	35	89
5	23	4	34	70	11	6	55	51	34	4	39	65
6	171	29	63	66	50	25	80	45	221	28	67	61
7	41	7	70	37	11	6	86	20	52	7	74	33
8	164	28	98	30	26	13	99	14	190	24	98	26
9	10	2	100	2	3	1	100	1	13	2	100	2
Total	587	100	100		196	100	100		783	100	100	
Mean	5.84				4.95				5.62			

TABLE LVIII

HIGH SCHOOL MATHEMATICS GRADES RECEIVED

	Algebra I				Algebra II				Plane Geometry				Trigonometry			
	Grad. N	Grad. %	Acad. N	Susp. %	Grad. N	Grad. %	Acad. N	Susp. %	Grad. N	Grad. %	Acad. N	Susp. %	Grad. N	Grad. %	Acad. N	Susp %
Taken	559	95.0	179	91.0	357	61.0	87	44.0	477	81.0	124	63.0	177	30.0	28	14.0
Not Taken	28	5.0	17	9.0	230	39.0	109	56.0	110	19.0	72	37.0	410	70.0	168	86.0
Grade																
A	136	24.0	14	8.0	61	17.0	4	5.0	86	18.0	3	2.0	43	24.0	1	4.0
B	191	34.0	54	30.0	122	34.0	17	20.0	171	36.0	20	16.0	55	31.0	9	32.0
C	176	31.0	69	39.0	121	34.0	41	47.0	163	34.0	63	51.0	62	35.0	10	36.0
D	53	9.0	37	21.0	49	14.0	23	26.0	52	11.0	36	29.0	15	8.0	4	14.0
E	3	1.0	5	3.0	4	1.0	2	2.0	5	1.0	2	2.0	2	1.0	4	14.0
	Solid Geometry				Business Mathematics				Ap./Shop Mathematics				Mathematics G.P.A.			
Taken	107	18.0	16	8.0	25	4.0	20	10.0	23	4.0	16	8.0	587	100	196	100
Not Taken	480	82.0	180	92.0	562	96.0	176	90.0	564	96.0	180	92.0	0	0.0	0	0.0
Grade																
A	20	19.0	2	13.0	5	20.0	3	15.0	6	26.0	1	6.0	100	17.0	4	2.0
B	32	30.0	3	19.0	12	48.0	5	25.0	11	48.0	5	31.0	231	39.0	43	22.0
C	40	37.0	5	31.0	7	28.0	6	30.0	6	26.0	9	56.0	225	38.0	114	58.0
D	14	13.0	4	25.0	0	0.0	5	25.0	0	0.0	1	6.0	31	5.0	33	17.0
E	1	1.0	2	13.0	1	4.0	1	5.0	0	0.0	0	0.0	0	0.0	2	1.0

TABLE LIX

AMERICAN COLLEGE TEST RESULTS

	Score	Graduates			Acad. Susp.		
		N	%	C% (Low-High)	N	%	C% (Low-High)
Composite	3	0	0		1	1	
	4	0	0		0	0	
	5	0	0		0	0	
	6	0	0		0	0	
	7	0	0		1	1	
	8	0	0		3	3	
	9	0	0		1	1	99
	10	1	1		2	2	98
	11	0	0		2	2	96
	12	2	1		6	6	94
	13	3	2	100	6	6	88
	14	5	3	98	4	4	82
	15	10	7	95	6	6	78
	16	4	3	88	10	10	72
	17	9	6	85	12	11	62
	18	10	7	79	5	5	51
	19	12	8	72	9	9	46
	20	15	10	64	7	7	37
	21	8	5	54	7	7	30
	22	10	7	49	8	8	23
	23	10	7	42	3	3	15
	24	17	11	35	6	6	12
	25	10	7	24	4	4	6
	26	14	9	17	1	1	2
	27	7	5	8	1	1	1
	28	3	2	3	0	0	
	29	2	1	1	0	0	
Total		152	102		105	104	
Mathematics							
	4	0	0		3	3	
	6	1	1		5	5	99
	7	0	0		2	2	94
	8	1	1		1	1	92
	9	1	1		1	1	91
	10	2	1		1	1	90
	11	1	1	100	2	2	89
	12	6	4	99	6	6	87
	13	7	5	95	8	7	81
	14	0	0	90	6	6	74

*Percentages do not equal 100 because of rounding errors

TABLE LIX (continued)

	Score	Graduates			Acad. Susp.		
		N	%	C% (Low-High)	N	%	C% (Low-High)
Mathematics (con't)							
	15	9	6	90	11	10	68
	16	10	6	84	5	5	58
	17	4	3	78	7	6	53
	18	14	9	75	5	5	47
	19	7	5	66	7	6	42
	20	19	12	61	4	4	36
	21	6	4	49	6	6	32
	22	9	6	45	10	9	26
	23	8	5	39	7	6	17
	24	5	3	34	1	1	11
	25	8	5	31	1	1	10
	26	5	3	26	1	1	9
	27	5	3	23	3	3	8
	28	7	5	20	2	2	5
	29	3	2	15	0	0	3
	30	6	4	13	1	1	3
	31	4	3	9	0	0	2
	32	4	3	6	1	1	2
	33	1	1	3	1	1	1
	34	1	1	2	0	0	
	35	1	1	1	0	0	
Total		155	104		108	102	
English							
	1	0	0		1	1	100
	6	0	0		1	1	99
	7	0	0		2	2	98
	8	0	0		2	2	96
	9	1	1	100	2	2	94
	10	2	1	99	5	5	92
	11	1	1	98	2	2	87
	12	2	1	97	6	6	85
	13	4	3	96	8	7	79
	14	6	4	93	8	7	72
	15	5	3	89	4	4	65
	16	12	8	86	14	13	61
	17	7	5	78	3	3	48
	18	14	9	73	9	8	45
	19	14	9	64	9	8	37
	20	11	7	55	9	8	29
	21	14	9	48	10	9	21
	22	13	8	39	7	6	12

TABLE LIX (continued)

	Score	Graduates			Acad. Susp.		
		N	%	C% (Low-High)	N	%	C% (Low-High)
	23	16	10	31	4	4	6
	24	11	7	21	2	2	2
	25	13	8	14	0	0	
	26	5	3	6	0	0	
	27	3	2	3	0	0	
	28	0	0	1	0	0	
	29	1	1	1	0	0	
Total		155	100		108	100	
Social Science							
	1	0	0		1	1	
	4	0	0		2	2	100
	6	1	1		1	1	99
	7	0	0		2	2	98
	8	0	0		0	0	96
	9	2	1		0	0	96
	10	1	1		3	3	96
	11	4	3	100	4	4	93
	12	2	1	97	4	4	89
	13	3	2	96	11	10	85
	14	6	4	94	8	7	75
	15	5	3	90	10	9	68
	16	6	4	87	4	4	59
	17	11	7	83	4	4	55
	18	6	4	76	5	5	51
	19	15	10	72	8	7	46
	20	13	8	62	9	8	39
	21	9	6	54	6	6	31
	22	7	5	48	6	6	25
	23	8	5	43	1	1	19
	24	6	4	38	7	6	18
	25	15	10	34	4	4	12
	26	7	5	24	1	1	8
	27	11	7	19	2	2	7
	28	1	1	12	3	3	5
	29	7	5	11	2	2	2
	30	4	3	6	0	0	
	31	3	2	3	0	0	
	32	2	1	1	0	0	
Total		155	103		108	101	

TABLE LIX (continued)

	Score	Graduates N	Graduates %	Graduates C% (Low-High)	Acad. Susp. N	Acad. Susp. %	Acad. Susp. C% (Low-High)
Natural Science							
	4	0	0		1	1	
	6	0	0		1	1	
	7	2	1		2	2	
	8	1	1		1	1	
	9	4	3		3	3	100
	10	1	1	99	5	5	97
	11	1	1	98	3	3	92
	12	0	0	97	4	4	89
	13	7	5	97	4	4	85
	14	4	3	92	5	5	81
	15	9	6	89	3	3	76
	16	8	5	83	7	7	73
	17	4	3	78	5	5	66
	18	6	4	75	4	4	61
	19	10	7	71	5	5	57
	20	6	4	64	10	10	52
	21	8	5	60	5	5	42
	22	11	7	55	9	9	37
	23	10	7	48	8	8	28
	24	8	5	41	2	2	20
	25	14	9	36	9	9	18
	26	12	8	27	2	2	9
	27	7	5	19	1	1	7
	28	7	5	14	3	3	6
	29	4	3	9	2	2	3
	30	1	1	6	1	1	1
	31	5	3	5	0	0	
	32	3	2	2	0	0	
Total		153	104		105	105	

TABLE LX

SEMESTERS OF HIGH SCHOOL MATHEMATICS TAKEN BY ACADEMIC DEPARTMENT

	Accounting		Business Education		Business Management		Economics	
	N	%	N	%	N	%	N	%
0	6	2	3	3	9	3	0	0
1	2	1	1	1	1	0	0	0
2	12	4	22	19	13	4	0	0
3	3	1	3	3	9	3	1	4
4	58	19	59	51	68	20	3	12
5	14	5	4	3	14	4	2	8
6	83	27	20	17	107	32	8	32
7	24	8	0	0	25	7	2	8
8	94	31	3	3	83	25	9	36
9	7	2	0	0	6	2	0	0
Mean	6.00 SH		3.95		5.76		6.36	

TABLE LXI

CORRELATION RATIOS OF SELECTED VARIABLES, COLLEGE OF BUSINESS BRIGHAM YOUNG UNIVERSITY 1965, 1966 GRADUATES AND STUDENTS ACADEMICALLY SUSPENDED DURING 1965, 1966

	Total Univ GPA	Grade Econ 111	Grade Econ 112	Grade Acct 201	Grade Acct 202	Grade Math 105	Grade Stat 221	Grade Math 101	L-Div Core GPA	Yr Econ 111 taken	Yr Econ 112 taken	Yr Acct 201 taken	Yr Acct 202 taken	Yr Math 105 taken	Yr Stat 221 taken	Yr Math 101 taken
Total Univ GPA	1.000	.557	.613	.444	.501	.517	.528	.543	.779	.044	.053	.038	-.106	-.042	-.149	.081
Grade Econ 111		1.000	.539	.348					.701	.136		.120				
Grade Econ 112			1.000			.365		.331	.730		.057					
Grade Acct 201				1.000	.485	.300			.716	.067		-.045		-.106		
Grade Acct 202					1.000	.322	.445		.742				-.124		-.127	
Grade Math 105						1.000	.395	.461	.665		.059			-.057		
Grade Stat 221							1.000		.711				-.083		-.112	
Grade Math 101								1.000	.499							-.055
L-Div Core GPA									1.000	.096	.064	.022	-.122	-.167	-.192	-.013
Yr Econ 111 taken										1.000		.479				
Yr Econ 112 taken											1.000			.044		
Yr Acct 201 taken												1.000				
Yr Acct 202 taken													1.000		.286	
Yr Math 105 taken														1.000		
Yr Stat 221 taken															1.000	
Yr Math 101 taken																1.000

TABLE LXI (continued)

	No. of HS Sem units Math	Grade HS Alg I	Grade HS Alg II	Grade HS Pl Geom	Grade HS Trig	Grade HS Sld Geom	Grade in HS Math	No. of HS Sem units English	GPA in HS English	No. of HS Sem units Science	GPA in HS Science	No. of HS Sem units Soc. Sc.	Grade in HS Econ	GPA in HS Soc. Sc.
Total Univ GPA	.076	.296	.397	.419	.450	.447	.399	.021	.442	.074	.389	-.042	.366	.452
Grade Econ 111	.150	.260	.243	.298			.207	.037	.293	.106	.289	-.016	.356	.378
Grade Econ 112	.089	.213	.232	.286			.259					-.064	.273	.346
Grade Acct 201	.051	.250	.247	.311			.305	-.090	.251	.003	.208	-.093		.225
Grade Acct 202	.036	.238	.277	.260			.284							
Grade Math 105	.176	.357	.357	.362			.386					-.010		.347
Grade Stat 221	.195	.254	.326	.328			.316							
Grade Math 101	.160	.379	.277	.266			.346							
L-Div Core GPA	.163	.346	.403	.444	.413	.413	.409	-.011	.399	.083	.371	-.070	.261	.428
Yr Econ 111 taken	.038	.091					.070	-.071	.134	.045	.023	-.129		.031
Yr Econ 112 taken	-.003	.018					.056					-.091		-.014
Yr Acct 201 taken	.040	.073					.060	-.022	.115	.035	.094	-.088		.075
Yr Acct 202 taken	.004	-.020					-.057							
Yr Math 105 taken	-.326	-.169					-.181					.020		-.179
Yr Stat 221 taken	-.216	-.165					-.144							
Yr Math 101 taken	-.152	-.146					-.127							

TABLE LXI (continued)

	No. of HS Sem units Business	Grade in HS Type	Grade in HS Bookkeeping	GPA in HS Business	HS GPA	HS Stanine Rank	No. Sem Hrs. Transfer Credit	Composite ACT	Math ACT	English ACT	Soc. Sc. ACT	Nat. Sc. ACT	No. of Repeats L-Div Core Courses
Total Univ GPA	-.050	.268	.343	.279	.517	.483	.160	.421	.232	.408	.393	.389	-.197
Grade Econ 111					.359	.324		.482	.308	.384	.466	.421	
Grade Econ 112					.345	.277		.487	.360	.412	.418	.428	
Grade Acct 201			.264		.249	.314		.352	.291	.288	.272	.292	
Grade Acct 202			.234		.302	.289		.446	.454	.288	.298	.422	
Grade Math 105					.409	.364		.388	.396	.376	.238	.276	
Grade Stat 221					.336	.314		.453	.491	.327	.303	.360	
Grade Math 101					.305	.304		.265	.251	.310	.278	.132	
L-Div Core GPA	-.105	.248	.376	.267	.494	.451	.158	.574	.473	.432	.472	.488	-.189

TABLE LXI (continued)

	No. of HS Sem units Math	Grade HS Alg I	Grade HS Alg II	Grade HS Pl Geom	Grade HS Trig	Grade HS Sld Geom	GPA in HS Math	No. of HS Sem units English	GPA in HS English	No. of HS Sem units Science	GPA in HS Science	No. of HS Sem units Soc. Sc.	Grade in HS Econ	GPA in HS Soc. Sc.
No. of HS Sem units	1.000	.137					.138	.137	.071	.238	.160	-.047		.081
Grade HS Alg I		1.000					.775	.047	.510	.038	.514	-.063		.481
Grade HS Alg II			1.000											
Grade HS Pl Geom				1.000										
Grade HS Trig					1.000									
Grade HS Sld Geom						1.000								
GPA in HS Math							1.000	.045	.602	.053	.583	.009		.544
No. of HS Sem units English								1.000	.091	.043	.104	.076		.128
GPA in HS English									1.000	.096	.632	.049		.665
No. of HS Sem units Science										1.000	.254	-.095		.121
GPA in HS Science											1.000	.011		.605
No. of HS Sem units Soc. Sc.												1.000		.109
Grade in HS Econ													1.000	
GPA in HS Soc. Sc.														1.000

TABLE LXI (continued)

	No. of HS Sem units Business	Grade in HS Type	Grade in HS Book-keeping	GPA in HS Business	HS GPA	HS Stanine Rank	No. Sem Hrs. Transfer Credit	Composite ACT	Math ACT	English ACT	Soc. Sc. ACT	Nat. Sc. ACT	No. of Repeats L-Div Core Courses
No. of HS Sem units Business	1.000	.127		.243									
Grade in HS Type		1.000		.873									
Grade in HS Book-keeping			1.000										
GPA in HS Business				1.000									
HS GPA					1.000								-.238
HS Stanine Rank						1.000							
No. Sem Hrs. Transfer Credit							1.000						
Composite ACT								1.000	.789	.701	.860	.870	
Math ACT									1.000	.374	.509	.594	
English ACT										1.000	.584	.466	
Soc. Sc. ACT											1.000	.717	
Nat. Sc. ACT												1.000	
No. of Repeats L-Div Core Courses													1.000

APPENDIX B

LIST OF VARIABLES

LIST OF VARIABLES

1. Total university grade point average
2. Total core grade in Economics 111
3. Total core grade in Economics 112
4. Total core grade in Accounting 201
5. Total core grade in Accounting 202
6. Total core grade in Mathematics 105
7. Total core grade in Statistics 221
8. Total core grade in Mathematics 101
9. Total lower-division core grade
10. Year in which Economics 111 taken
11. Year in which Economics 112 taken
12. Year in which Accounting 201 taken
13. Year in which Accounting 202 taken
14. Year in which Mathematics 105 taken
15. Year in which Statistics 221 taken
16. Year in which Mathematics 101 taken
17. Number of high school semester units of mathematics taken
18. Grade in high school Algebra I
19. Grade in high school Algebra II
20. Grade in high school Plane Geometry
21. Grade in high school Trigonometry
22. Grade in high school Solid Geometry
23. Grade point average in high school mathematics
24. Number of high school semester units of English taken
25. Grade point average in high school English
26. Number of high school semester units of science taken
27. Grade point average in high school science
28. Number of high school semester units of social science taken
29. Grade in high school economics
30. Grade point average in high school social science
31. Number of high school semester units of business taken
32. Grade in high school typewriting
33. Grade in high school bookkeeping
34. Grade point average in high school business
35. High school grade point average
36. High school stanine rank
37. Number of semester hours of transfer credit
38. Composite American College Test score
39. Mathematics American College Test score
40. English American College Test score
41. Social science American College Test score
42. Natural science American College Test score
43. Total number of repeats for lower-division core courses
44. Lower-division core grade point average--Brigham Young University
45. Lower-division core grade point average--transfer

AN ANALYSIS OF INTELLECTUAL FACTORS BEARING ON SUCCESS IN THE COLLEGE OF BUSINESS, BRIGHAM YOUNG UNIVERSITY, PROVO, UTAH

An Abstract
of a Dissertation Presented to
the Graduate Department of Education
Brigham Young University

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

by
Harold T. Smith
July 1967

ABSTRACT

Statement of the problem. This study was designed to determine admission requirements for freshman and transfer students in the College of Business.

Procedures. This study was conducted at Brigham Young University on records of students who graduated or were academically suspended during 1965 and 1966. Data were collected from high school and university transcripts, and ACT records. Frequency distributions, statistical tests of difference, and correlation analysis tests were processed on the computer for 783 samples. Significantly different variables which showed a high correlation with university grade point average (GPA), lower-division core G.P.A., and grades in specific lower-division core courses were considered for selection as admission requirements for the College of Business.

Findings.

1. Differences between graduates and academically suspended students in lower-division preparation were as follows: (a) graduates earned significantly higher total university and lower-division core G.P.A.'s, (b) graduates took lower-division core courses significantly later (one semester), (c) graduates transferred significantly more hours of credit from other institutions of higher education, and (d) a significantly larger number than was expected of the academically suspended students were non-transfer students.

2. Grades earned in College of Business lower-division core courses were lower than those in courses outside of the college.

3. Students received significantly higher grades in lower-division core courses at other colleges and universities than they received at Brigham Young University.

4. Transfer students received a significantly higher total lower-division core G.P.A. than non-transfer students, but there was no significant difference in these same grades received at Brigham Young University. For transfer students only, there was no significant difference between graduates and academically suspended students in lower-division core grades received at other institutions.

5. Differences between graduates and academically suspended students in high school preparation were as follows: (a) graduates took a significantly larger number of units of mathematics and science; (b) academically suspended students took a significantly larger number of units of social science and business; (c) there was no significant difference between the two groups in the number of units of English taken; (d) graduates took more courses in advanced mathematics; (e) graduates achieved higher grades in mathematics, English, social science, science and business; (f) the number of graduates majoring in college preparatory programs and the number of academically suspended students majoring in high school business programs was significantly different from that expected; and (g) graduates achieved significantly higher high school G.P.A. and rank in their high school graduating class.

6. Graduates achieved significantly higher scores on the ACT than academically suspended students.

7. Correlating with university and lower-division core grades, the following variables showed the highest relationships: lower-division core G.P.A. and grades; high school G.P.A., rank, and grades; and ACT scores. Correlations (r's) ranged from mid-thirties to high-seventies.

July 5, 1967
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